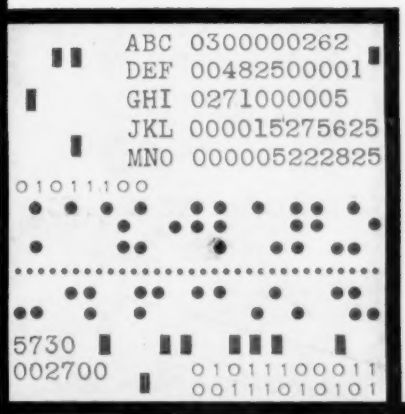
Data Processing and Microfilming SYSTEMS

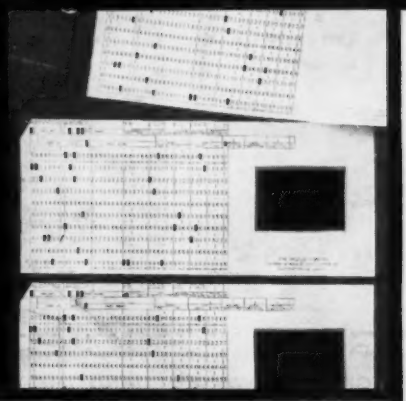
JULY 1960

The Information Management Magazine of Ideas, Methods and Procedures



CALIFORNIA STATE LIBRARY

STATE LIBRARY
ATT MISS EDITH IRWIN
IR PERIODICAL DEPT
CRAMENTO CALIF



Your Subscription Is Sponsored With The Compliments Of

BAY MICROFILM, INC.

BAY MICROFILM, INC.

OFFERS

PERFECTION—the added quality in the microfilming of,

ENGINEERING DRAWINGS

HOSPITAL RECORDS

X-RAYS

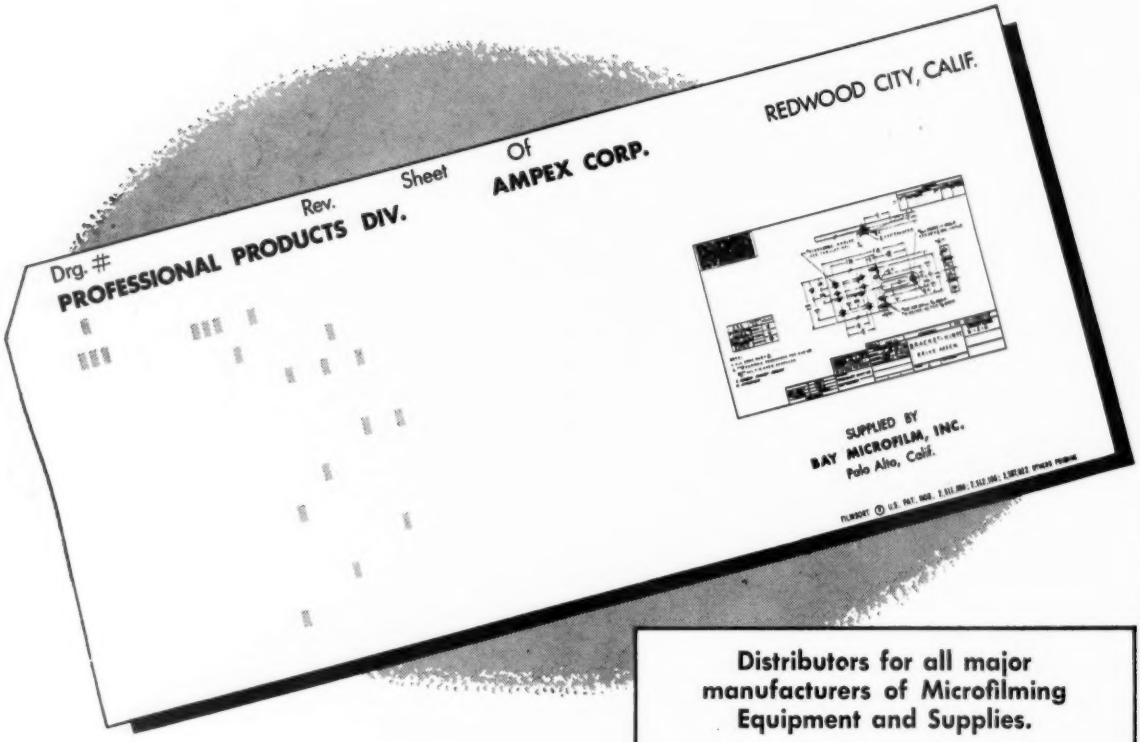
GOVERNMENT DOCUMENTS

BUSINESS RECORDS—

(EDMS) Engineering Data Micro-Reproduction Systems

plus the service of

EXPERT SYSTEMS CONSULTANTS



Distributors for all major manufacturers of Microfilming Equipment and Supplies.

A Microfilming Dealer of RECORDAK®

MICROGRAPHIC SYSTEMS

FOR THOSE WHO DEMAND THE BEST

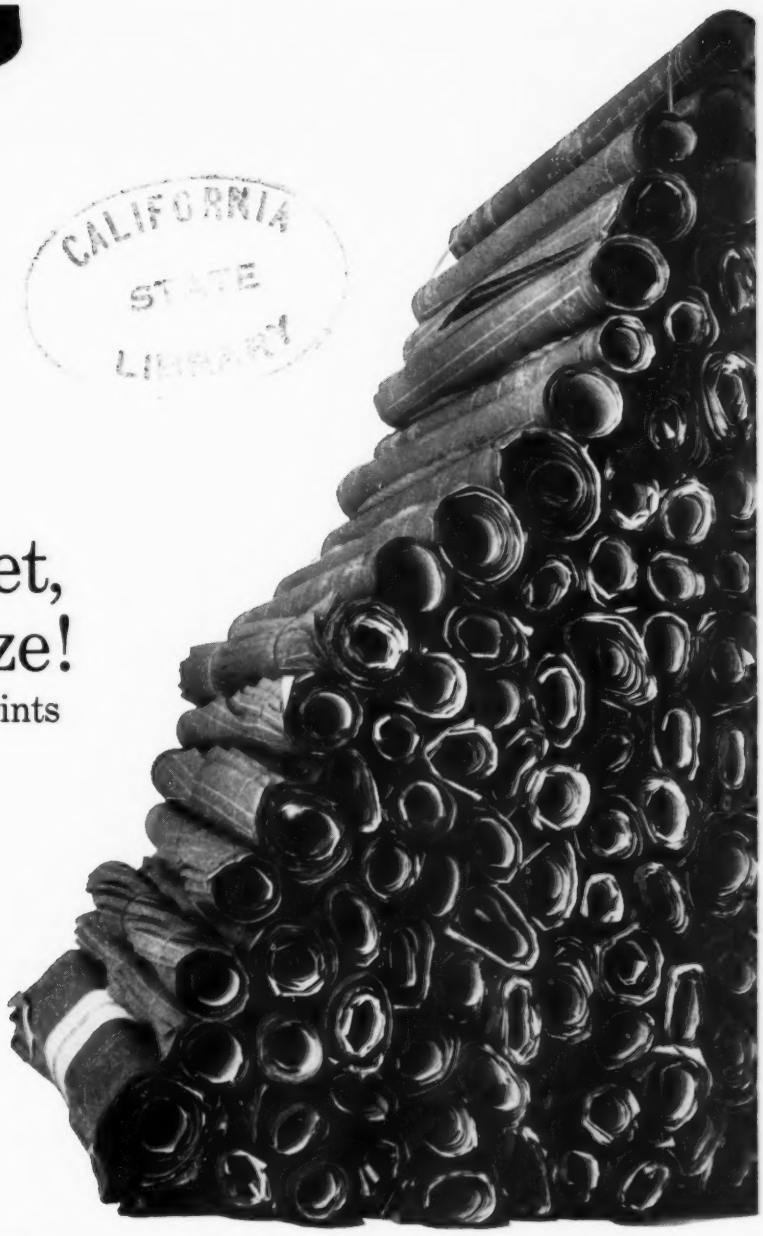
4009 TRANSPORT STREET, PALO ALTO, CALIFORNIA

DAvenport 6-1812 **YOrkshire 8-5088**

CALIFORNIA
STATE
LIBRARY

File Cabinet, Gevaert Size!

Contents: 785 Blueprints



DUPLOFILM: The Miracle of Microfilm backed by the Service and Quality of Gevaert!

Today . . . miles of industrial documents are finding safe, orderly storage in relatively minute archives of Gevaert Duplofilm. Space-saving miracle indeed! *Gevaert quality* is your assurance of reproduction fidelity down to the faintest hairline. *Gevaert service* (a branch office in your locality, six warehouses throughout the country) keeps you in supply at all times. Available in 16mm and 35mm, in 100', 200', and 1000' lengths.

Duplo Pan – the standard film for charts, letters, maps, etc. Very fine grain, extremely high contrast. Sensitive to all colors. Has special anti-halation layer which disappears during processing.

Duplo Pan Rapid – high sensitivity, fine grain and high contrast. Especially designed for automatic and continuous equipment. Anti-halation layer.

Duplo Copy – Special microfilm for preparation of positive copies from microfilm negatives. Has extremely fine grain and relatively high contrast. Excellent for both line and continuous-tone negatives.

Write for your copy of 32-page booklet "Microcopies on Gevaert Duplofilms."

GEVAERT

THE GEVAERT COMPANY OF AMERICA, INC.
321 West 54th Street, New York 19, N. Y.

District Offices: Lincolnwood, Ill. (Chicago) • Los Angeles • Dallas • Denver • San Francisco

Circle No. 506 on Post Card

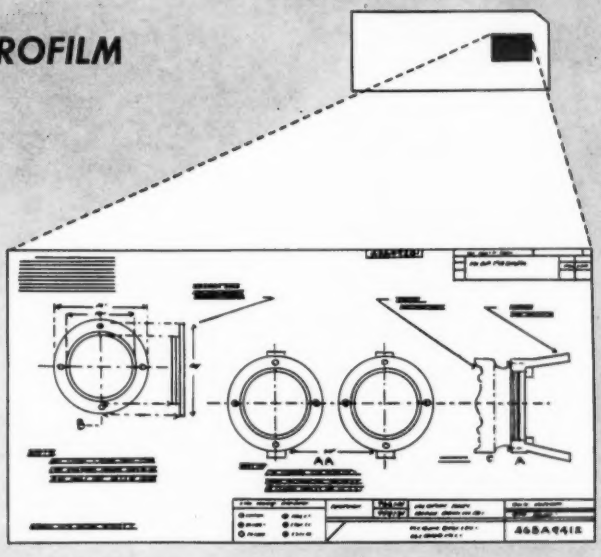
ANKEN PROJECTION MONO-COPY PAPER

takes you

from ***NEGATIVE MICROFILM***

to ***POSITIVE COPY***

in minutes



That's right! Make quick, inexpensive positive copies directly from negative microfilm, using Anken Projection Mono-Copy paper.

And the doing is easy! You expose in the normal manner on any standard enlarger; then develop in Anken's Monobath solution, using a machine processor of the Anken "27" type. *Eliminates the time-consuming, three-tray manual developing operation.*

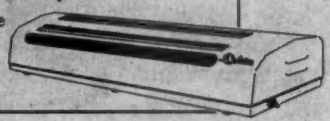
The results? Perfect copies every time . . . no loss of detail. And Projection Mono-Copy is designed for use with all types of microfilm — in aperture cards, in strips, jackets, or on roll film — from all sizes to 105mm.

The Mono-Copy enlargements can be transparentized and used as intermediates for making diazo copies.

FREE BROCHURE

For more information on Anken Projection Mono-Copy, and how it can work for you, write for your free brochure today!

The Anken "27" develops and stabilizes prints in one convenient, compact, double tray unit. Handles any size up to 27 inches wide by any length.



ANKEN FILM COMPANY

a wholly-owned Subsidiary of Anken Chemical & Film Corp.

Newton • New Jersey

Circle No. 519 on Post Card

Data Processing and Microfilming SYSTEMS

VOLUME 1 **NUMBER 1**

James S. Watkins, Publisher
Mitchell M. Badler, Editor

EDITORIAL DEPARTMENT

James J. Hughes, Executive Editor
Jill English, Assistant Editor
Dorothy Efinger, Editorial Assistant

EDITORIAL ADVISORS

Hubbard Ballou — D. W. McArthur
Hugh Fifield — Morton M. Raymond
Herman Limberg — Milton Reitzfeld
Frederic Luther — Robert Shiff
William Warren

BUSINESS DEPARTMENT

Rodd Exelbert, Business Manager
Aaron L. Lafer, Advertising Manager
Bert Lefkowitz, Eastern Advertising Representative
Fred J. Ross, Midwest Advertising Representative
Noel Grady, Western Advertising Representative
Ella May Darrin, Merchandising Manager
Paul Baker, Circulation Manager

PRODUCTION DEPARTMENT

Charles Feldman, Production Manager
James M. Commodore, Production Control
Arnold Schaffer, Art Director

UBP

DATA PROCESSING & MICROFILMING SYSTEMS is published quarterly by Data Processing Publishing Corp. **No material in DATA PROCESSING & MICROFILMING SYSTEMS may be reprinted without written permission. Copyright 1960 by Data Processing Publishing Corp., 10 East 40th St., New York 16, N. Y.** **Application for entry as controlled circulation publication pending at Pittsfield, Mass.**

President Samuel G. Krivit
Vice President Simon T. Krivit
Vice President Edward Wagner
Vice President James S. Watkins

Editorial and Executive Offices
10 East 40th St., N. Y. 16, N. Y.
phone: Murray Hill 6-3100

Midwest Office
100 East Ohio St., Chicago
phone: DElaware 7-6874

Western Office
4020 West Third St., Los Angeles
phone: DUnkirk 3-7336

SUBSCRIPTION: United States, Canada and U.S. territories — $2 for one year; foreign countries — $4 for one year.

EDITORIAL

Systems Management

The observers of the trends have predicted that the 1960's will be recorded as the systems decade. If this is true — and we are certain it is — then systems management is the coming field for the enterprising management man.

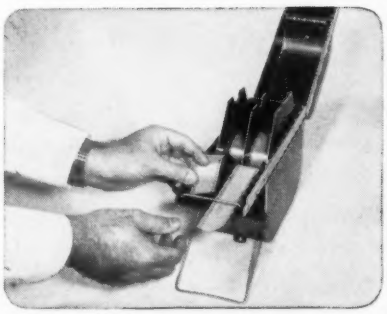
Producing information rather than producing reports is the purpose of a system. The systems manager (known also as the information manager) attacks the problem from this viewpoint. He begins at the top, asks what information is needed, sees how that information may best be produced and works down from there. Data and information are the indispensables in the functioning of our complex society, and the information manager is becoming a key man in plans formulation.

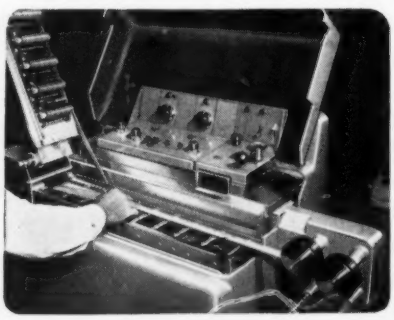
Our aim is to serve these information and systems management specialists, the people responsible for collecting, recording, retrieving, processing, evaluating and distributing information. They are planners, organizers and executors. Their tools are varied . . . electronic data processing and magnetic tape, aperture cards, microfilm and microforms, recordings, and paper records. These are all used singly and in systems combinations. Each individual technique performs vital functions but collectively their most important uses are as integral parts of total modern systems.

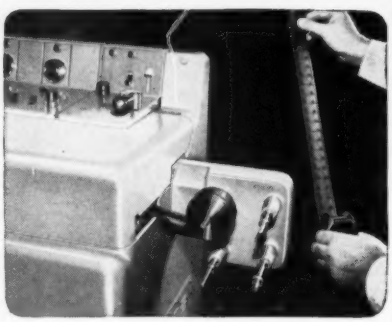
The backbone of our magazine will be the presentation of case histories that show how organizations are handling their information management problems in such varied areas as banking and finance, insurance, research and development, engineering, retailing, wholesaling, transportation, government; military agencies, universities. We will point up the systems that others have found most effective for consideration by readers who may have similar problems. In addition, we will feature discussions of new developments and techniques as they develop.

We look forward to your comments and suggestions. An interested readership is the best guarantee of a magazine that serves its readers' interests. Let us hear from you.

MICROFILMING
AERIAL PHOTOGRAPHY
MASS PORTRAITURE
INSTRUMENTATION







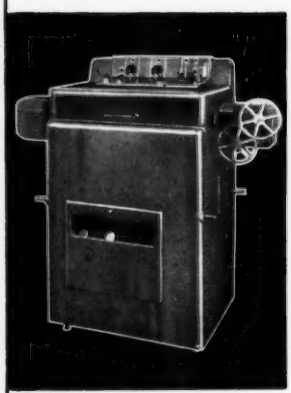
FILM PROCESSING SIMPLIFIED

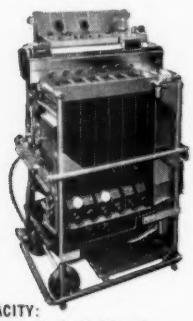
CARL Tri-Film Processor

develops and dries automatically

- *Simple daylight loading magazine*
- *Magazine inserted—no special leaders required*
- *Film connected directly to tendency-driven take-up spools*
- *Processed film completed at up to 6 feet per minute*

The Mark 3 Automatic Tri-Film Processor develops and dries 16, 35 and 70 mm. film at 1½, 3 or 6 feet a minute. Separate temperature control of the processing solutions from 60 to 110 degrees F. is possible within ±1 degree. Processing is controlled by a mechanical program unit after the film is daylight loaded, and positive squeegee rollers reduce the need of stop baths and interbath rinses. The processor is perfect for newsreels, motion picture rushes, microfilm and all types of negative/positive cinematography where speed plus quality is essential.





CAPACITY:
16 mm. 1 to 4 rolls } length
35 mm. 1 to 2 rolls } to
70 mm. 1 roll } 400 ft.

PROCESS RATE: 1½, 3 or 6 ft. a minute.

SPECIFICATIONS
SIZE: 54" long, 22" wide, 51" high
WEIGHT: 550 lbs.
POWER: 5KVA maximum single-phase: 110 volts, 45 amps., or to customer requirements.

Western U.S. Representatives
Gordon Enterprises
5362 North Cahuenga Blvd.
North Hollywood, Calif., U.S.A.

CANADIAN APPLIED RESEARCH LIMITED

where ideas become reality

750 Lawrence Avenue West, Toronto 19, Ontario, Canada

ELECTRONICS • MECHANICS • OPTICS
DESIGNING • ENGINEERING • MANUFACTURING
ENVIRONMENTAL TESTING • REPAIR AND OVERHAUL

Canadian Representatives for LIBRASCOPE, CIE. CROUZET, ROBOT-FOTO

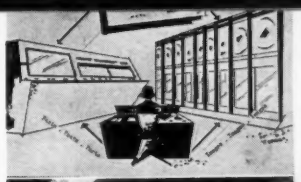
MEMBER: A. V. ROE CANADA LIMITED & THE HAWKER SIDDELEY GROUP

Circle No. 504 on Post Card

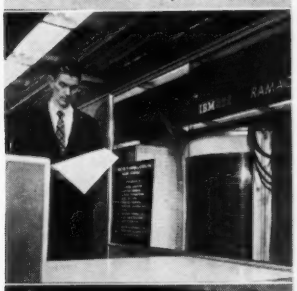
Data Processing
and Microfilming
SYSTEMS

July 1960

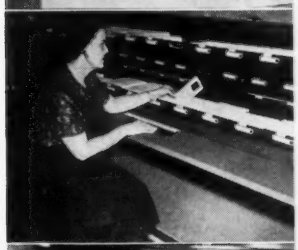
12



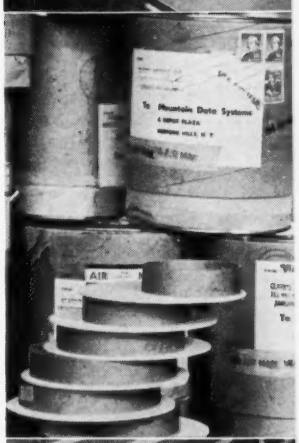
16



18

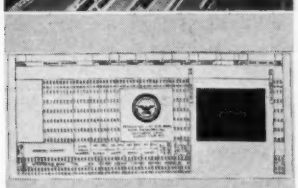


22



26

27



28

Contents

12 **The Photomemory Phenomenon**
Indexing microfilm images in mechanized memory units is on the horizon.

14 **No More Needle Hunting**
Finding an engineering drawing is a snap when it's on microfilm.

16 **MOS Means More $ $ $**
American Bosch enthusiastic about Management Operating System.

18 **Out Of The Paper Business**
Changeover in Air Force data distribution policies.

22 **Merchandising With EDP**
Data processing program provides comprehensive sales information.

24 **Key To Wider Services**
Chicago institution is first bank to convert checking operation to EDP.

26 **105mm Speeds Jet Airport**
Microfilm joins the picks and shovels in helping build Dulles International.

27 **DOD Readies EDMS Program**
Defense Department's specs for its Microreproduction system.

28 **Heald Lops Off Printing Time**
Photocopy installation breaks blowback bottleneck.

29 **EDP In Action**
Milton Reitzfeld discusses forms design, the backbone of automation.

30 **Save The Space For Selling**
Microfilm frees filing area for department store sales activity.

The Departments

6 Information Management
8 New Equipment Review
9 Industry News
10 Microfilm Topics
32 Yours for the Asking
39 Systems Bookshelf
40 Newsmakers

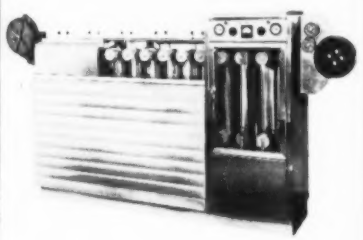
REPRODUCTION WITHOUT PERMISSION IS STRICTLY PROHIBITED

The World's Finest

HIGH QUALITY LARGE CAPACITY

Microfilm Processors

are made by **ANA-TEC**



Quality and Capacity: Keys to Profitable Microfilm Processing

ARCHIVAL WASH

All Ana-Tec machines process film to meet the most rigid government standards for archival wash, density, resolution and freedom from physical defects.

OUTSTANDING QUALITY

More than 50 features stamp Ana-Tec processors as the ultimate in high quality automatic film processing equipment.

THREE PROFIT-MAKING MODELS

All Ana-Tec machines look the same and are built of the same superior components . . . They differ only in size.

Speeds given below are for 35 mm film processed at 70 degrees to archival results:

- MODEL 401. Processes from 1,500 feet to 3,000 feet per hour.
- MODEL 402. Processes from 850 to 1,750 feet per hour.
- MODEL 403. Processes from 450 to 850 feet per hour.

16mm speeds approximately double above.

MORE CAPACITY PER DOLLAR

Check for yourself and see how Ana-Tec microfilm processors — beside their top quality — *are also the lowest in price for each foot of machine capacity!*

IMPORTANT LABOR SAVINGS

Ana-Tec frequently processes in 2 or 3 hours the same quantity of microfilm it takes an operator 8 to 10 hours to run through a small machine.

Time figuring will show how a large capacity machine can easily save $5,000 or more per year in labor costs . . . as well as making possible much greater production.

Ana-Tec Microfilm Processors Are Now Distributed by

MICRODEALERS, INC.

For specifications, literature or prices contact your nearest **MICRODEALER** *or write directly to*

ANA-TEC, INC.

2054 Granville Avenue
Los Angeles 25, California

"specialists in the design and manufacture of film processors"

Circle No. 502 on Post Card

Information Management

by DR. HERMAN LIMBERG
Director, Management Reporting Systems
Office of the City Administrator, New York, N.Y.

Some Specifics on Data Harnessing

In the annals of office management the 1950's will undoubtedly be described as the decade of data processing; the 1960's, if present indications are correctly interpreted, will probably be hailed as data harnessing's decade.

Current thinking reveals a wide acceptance of technological advances in processing of data and full confidence in the potential for even better and greater improvements. However, there has been a significant groundswell of interest in the basic concepts of information *needs* as the volume of data has continued to grow with increased data generation and compilation.

Facts Mean Paperwork

It is generally recognized that the development and practice of scientific management have fostered the recording and accumulation of *facts* upon which all science is based. The compilation of facts inevitably necessitates and produces paperwork comprising forms, records and reports. The production, use, handling and storing of paperwork, euphoniously and generically termed "data processing," have thus become an integral phase of scientific management. The progression from manual means to mechanization to automation has changed the dimensions of data processing, but technological advances have not been directed toward the flow of paper; they have facilitated and accelerated the production of more and more paperwork.

Data harnessing—or *information management*—is the answer to the challenge of electronic data processing. It is the core of a "back-to-basics" campaign to restore the vitality of the principles of scientific management. The new look at old principles, in this era of forward prejections, has focused on *objectives* and *pertinent facts*. In these two factors of scientific method lie the key to the fulfillment of the promise of the 1950's and the glory of the 1960's.

Be Specific

The *objectives* of any enterprise and its major components should be stated in specific, measurable terms, starting at the top of the organization where direction and focus should be provided for the objectives of each lower level of the hierarchy. The *pertinent facts* required for planning, coordination and control should then be developed and defined within the context of the objectives of each level. Determination of the pertinent facts should be guided by "what management *needs* to know" at each level and should produce key indicators of accomplishments and variances, and signals for necessary follow-up and action.

Establishment of objectives and determination of the significant and pertinent information required constitute the first phase of *information management*, a relatively new term for the fundamental or basic approach in designing a reporting system.

In the second phase, a bottom-up review should be made of the existing data processing and reporting structure to ascertain whether the information generated and produced meets the pre-

determined needs. The resulting findings may show (1) needs are being met adequately, or (2) there is an excess of data, or (3) required information is not available, or (4) a combination of (2) and (3).

In the third phase, the necessary revisions and improvements should be made in existing systems, procedures and data processing techniques to provide the needed information as efficiently, effectively and economically as possible.

This three-phase approach should be distinguished from the "reports control" program which usually begins with the accumulation of copies of all reports or the preparation of analytical questionnaires, and is followed by an appraisal of the uses and purposes of existing reports.

Mental Lassitude

While the conventional reports-control technique can produce desirable results, it is too frequently hampered by the tendency to retain much of the established structure because of habit or mental lassitude. The result may thus be a light dusting rather than a thorough house cleaning. By comparison, this fundamental or basic approach begins with a determination of *actual needs* and provides a finer mesh through which present reports must be screened. To use a mixed metaphor, the basic approach acts as a mental cathartic to purge the system of impedimenta before designing the structure that will accommodate the specified information needs.

Necessary Distinction

In the study of the sources, flow and means of generating the required information, a distinction should be made between data for *operational* purposes (e.g. inventory control, payroll, purchase and sales orders, production planning and control, etc.) and information essential for management planning, evaluation and control. Management

continued on page 37

call your **MICRODEALER**

for

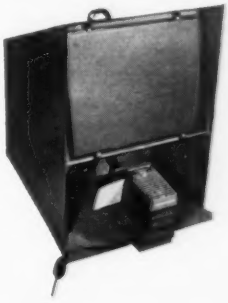
QUALITY MICROFILMING SERVICE

BIEL'S PHOTOCOPY & MICROFILM SERVICE
Buffalo, New York • Tel: WAshington 6224
DAKOTA MICROFILM SERVICE, INC.
Denver 15, Colorado • Tel: BElmont 7-0408
Omaha, Nebraska • Tel: ATlantic 4013
St. Paul 3, Minnesota • Tel: CApital 2-3777
DAKOTA SOUTHERN MICROFILM SERVICE, INC.
Miami, Florida • Tel: FRanklin 4-8402
GRAPHIC MICROFILM CORPORATION
New York 6, New York • Tel: REctor 2-4321
Farmingdale, New York • Tel: MYrtle 4-0020
Washington 25, D. C. • Tel: MEtropolitan 8-5550
GRAPHIC MICROFILM OF NEW ENGLAND, INC.
Waltham 54, Mass. • Tel: TWinbrook 4-9494
Hartford 14, Connecticut • Tel: CHapel 6-7196
HALL & McCHESNEY, INC.
Syracuse, New York • Tel: SYracuse 2-7201
Greensboro, N. C. • Tel: BRoadway 4-8431
MICROFILM BUSINESS SYSTEMS COMPANY
Los Angeles 16, Calif. • Tel: WEbster 8-2977
THE MICROFILM CORPORATION
Cleveland 14, Ohio • Tel: SUperior 1-3654
Cincinnati 13, Ohio • Tel: REdwood 1-2408
SOUTHERN MICROFILM CORPORATION
New Orleans 19, La. • Tel: JAckson 5-6241
Houston 6, Texas • Tel: JAckson 6-2376
WATLAND, INC.
Chicago 20, Illinois • Tel: PRospect 8-4400
WESTERN MICROFILM COMPANY
San Francisco 11, Calif. • Tel: GArfield 1-4360

Through its affiliates MICRODEALERS, Inc. provides a nationwide personalized service and distribution of modern economical equipment including:

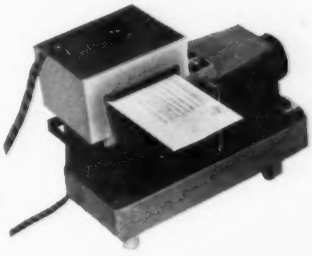
The
DRAFTSMAN
READER

- Designed for efficiency
- Priced for economy



MICRODEALER'S LIGHT CONTROL
Automatically controls light intensity on all cameras assuring uniform background density — speeds production — eliminates costly exposure errors — helps meet most exacting specifications.

PERMA-FIX
attachment for the Draftsman reader for instantaneous duplication of aperture card film.



MICRODEALERS *are also distributors of*

- KALVAR Film and Products
- ANA-TEC Processors
- APERTURE Cards
- RECORDAK Equipment

For further information about MICRODEALERS Products and services write:

MICRODEALERS INC.
1560 TRAPELO ROAD
WALTHAM 54, MASS.
TW 4-7777

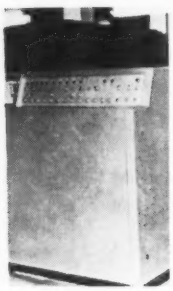
Circle No. 510 on Post Card

New Equipment Review

For more information without obligation circle same number on Reader's Inquiry Card

Microfilmer 101

Recordak Corp. has introduced the Reliant 500 which will record up to 500 checks or 185 letters on microfilm in a single minute. Features include Kodamatic indexing to facilitate retrieval, high speed feeder, document counter and interchangeable film units. By changing film units reduction ratios of 40:1, 32:1 and 24:1 can be obtained. The Reliant is about half the height of comparable microfilmers.



High-Speed Printer 102

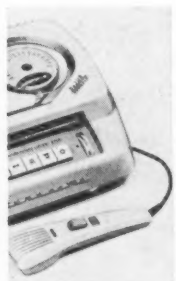
A printing unit operating at 600 lines per minute that is compatible with both the Univac line of tape-fed computer systems and those of other companies was announced by *Remington Rand*. The equipment consists of a tape reader, control unit and printer. The unit reads, checks and prints out information from the magnetic tape on which the computer has recorded its calculations. It prints entire lines of data at once.

Projector/Printer 103

An electrophotographic projector/-printer called the Kecofax which is capable of reproducing engineering drawings up to 34 x 48 inches is available from *Keuffel & Esser*. Film is loaded into a holder, exposure time is set and a push of a button does the rest. Projection size is varied by moving the projector head on an overhead track. One negative can make up to 19 points. Each print takes 40 seconds.

Microfilm Catalog File 104

A VSMF microfilm catalog file will be produced this year by the *Rogers Publishing Co.* for the communicati[illegible] and automotive industries. The comp[illegible] unit consists of a microfilm file, reade[illegible] and photocopy service and permits retrieval and scanning of technical literature on components and replacements. The first VSMF edition for the missiles industry contained 25,000 catalog pages on 22 reels and is brought up-to-date every four months.

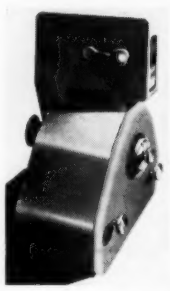


Dictating Machine 105

DeJur Grundig has announced a new dictating-transcribing machine, the Stenorette-T. The machine uses magnetic tape and one reel will record up to 45 minutes. The same reel can be used indefinitely. Voice control will suppress high voices and boost low ones, providing uniform playback volume. There is a converter unit which can be plugged into a dashboard cigarette lighter socket.

Printer for Computers 106

The *Stromberg-Carlson* S-C 4020 microfilm printer is designed to operate as peripheral equipment for the output of large scale digital computers. Output is on 35mm film in the form of plotted curves, tabular data or alpha-numeric printing. Part of the unit includes a Kelvin Hughes Rapid Processing Camera which allows the scientist or engineer to see film 8 sec. after data is received from the computer.



Hi Fi Enlarger 107

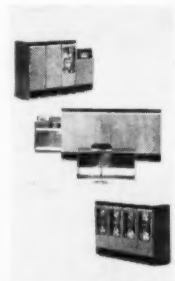
Microcopy Inc. has introduced the Model 120 continuous flow slit type microfilm enlarger. The image is projected from the negative to a slit that permits the exposing of sensitized material as it moves past. The 120 enlarges from 35mm to 10-inch width paper at speeds to 20 feet per minute on 1000-foot rolls. It also provides a screen for checking and selecting frames from rolls.

Data Processing System 108

The RPC-9000 electronic data processing system which provides "in line" records processing has been announced by *Royal Precision*. The RPC-9000 accepts — at random — information from such records as time cards, sales reports, and other business data and updates the appropriate files. System includes a central processing control unit, continuous magnetic tape file for storage and an input-output typewriter system.

Engineering Microfilmer 109

DeFlorez Co. announces a high-speed microfilmer for reproducing engineering drawings at the rate of 1,200 per hour. The machine feeds drawings from a pile, registers them, draws them under the camera, gives proper exposure and photographs the drawings. Sheets up to 22 x 34 inches and roll drawings up to 42 inches are handled by the machine. Camera's resolution equals 130 lines per millimeter at center.



Data Processing Unit 110

A high-speed computing system for handling scientific problems, statistical studies and commercial data processing has been developed by *Bendix Aviation Corp.* Called the G-20, it achieves addition rates of 45,000 operations per second at a relatively low cost-per-operation. The Central Processor's 4,096 word core memory may be expanded to a maximum of 32,768 words by addition of accessory memory modules.

continued on page 33

Industry News

● **Frederic Luther** was elected president of the National Microfilm Association at the group's annual convention this spring. Other officers for 1960-61 include Carl E. Nelson, vice president, and Charles E. Fennell, treasurer. Attendance at this year's meeting surpassed all previous records with some 1,000 registrants.

NAVY ADMINISTRATORS and systems analysts gathered last month in N.Y.C. for the source data automation seminar of the 3rd and 4th Naval districts.

● **Data processing for as low as $10 a month is being offered to small business men. A small suburban company in the middle west has been set up "specializing in applications for the man who has been left out."**

● **The American Management Association** is again offering a nine-week summer study program at Colgate University, Hamilton, N.Y., from July 6 through August 31. All ten of AMA's divisions including the office management section will offer seminars at the gathering. Subjects of the office management workshops include communications, data processing, work measurement and standards, etc. For more details write: American Management Association, 1515 Broadway, N.Y. 36, N.Y.

● Several management information conferences have convened recently. At its San Francisco meeting the National Machine Accountants Association elected the following officers: L. W. Montgomery, president; W. C. Andrews, Jr., executive vice president.

Other groups holding annual conferences included: Federal Government Accountants Association, U.S. Navy (Source Data Automation Seminar), members of the Management Information Roundtable and the Railway Systems and Procedures Association.

● **The Systems and Procedures Association** is offering a 10-year cumulative index of articles which have appeared in *Systems and Procedures* magazine. For a copy of the index write: SPA, Penobscot Bldg., Detroit, Mich.

● **Johns-Manville Corporation** has made public the details of an extended program for establishing six regional data processing centers across the nation for the 41 regional plants. This pioneering effort in the centralization of paper work is expected to be in operation by mid-1961.

● Bad news is in store for ambulance-chasing attorneys in New York state. The legislature has voted $27,000 to set up a complete file of negligence retainers from all NYC Supreme Courts. They will be graded and processed on IBM machines and then put on microfilm. The system was put into operation this month.

● **International Business Machines Corporation** has announced a new data processing system capable of computing business data twice as fast as the company's 7070. Dubbed the 7074, the new computer is the most advanced system except for the highly specialized $10,000,000 "Stretch" computers.

● Although most reproduction departments wait until a engineering drawing is released before microfilming it, one department has found it helpful to reproduce the drawings *before* release. The prerelease microfilm is mounted in aperture cards for the project engineer. In many instances this small file of aperture cards is discarded as soon as the drawings are officially released and title blocked.

Calendar of Conferences

National Society of Public Accountants, Muehlebach Hotel, Kansas City, Mo., Aug. 22-26.

Association for Computing Machinery, Marquette University, Milwaukee, Aug. 23-25.

National Business Forms Associates, Chase Park-Plaza Hotel, St. Louis, Sept. 14-17.

Stationery & Office Equipment Association, Conrad Hilton Hotel, Chicago, Sept. 24-28.

American Institute of CPA's, Bellevue-Stratford & Sheridan Hotels, Philadelphia, Sept. 25-28.

National Association for Bank Audit, Control & Operation, Statler Hotel, Los Angeles, Oct. 10-12.

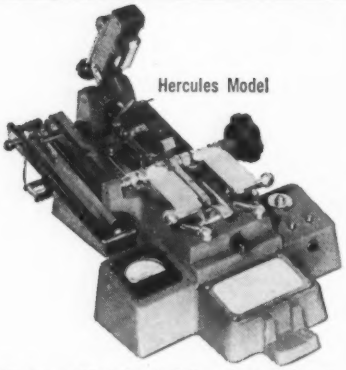
International Systems Meeting, Biltmore and Commodore Hotels, N.Y.C., October 10-13.

American Records Management Association, Plankinton House, Milwaukee, Oct. 19-22.

Controllers Institute of America, Fairmont Hotel, San Francisco, Oct. 22-26.

National Business Show, Coliseum, N.Y.C., Oct. 24-28.

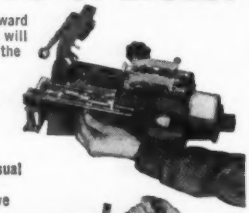
NEW
INTERMIX
PRESTO-SPLICER
HANDLES EVERY JOB



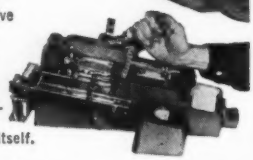
Newly modified Presto-Splicer butt-welds motion picture film, microfilm, acetate, mylar, Polyester, safety-base, paper . . . or any other kind of tape or film . . . AND INTERMIXES ANY OF THESE MATERIALS making a failure-proof, invisible weld that is literally the strongest part of the tape. Every splice you make will be a cleaner splice . . . a stronger splice . . . a PERMANENT splice, with

PRESTO-SPLICER

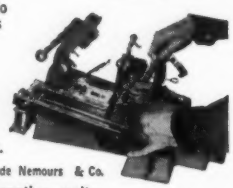
Slide handle toward you as far as it will go. This brings the special Mylar* tape with thermal setting adhesive into position.



Splice in the usual manner. Heat sets the adhesive but does not disarrange the molecular structure of the tape. The bond is permanent, stronger than the film itself.



Use the trimmer to remove the surplus tape. The entire procedure is so simple, so positive, that no special training is needed for your existing personnel.



*T.M. E. I. duPont de Nemours & Co.

For further information, write

PRESTOSEAL MANUFACTURING CORP.
37-27 33rd Street
Long Island City 1, N.Y.

Circle No. 513 on Post Card

Microfilm Topics

Electrostatic Prints: Conversation Topic

by HUBBARD BALLOU, *Columbia University*

The one topic that appeared most often in casual conversations at the ninth annual meeting of the National Microfilm Association was that of the DOD Specs, or to use their full name: the Department of Defense Standards and Specifications for the Engineering Data Micro-reproduction System. A half-day session of the formal program was devoted to this application. It would take too long to describe the full session in this column, but those who are interested in this subject can turn to Ernest Taubes' account on page 27 or request a copy of *Filmsort Facts,* April 1960 from Minnesota Mining & Manufacturing Co. Boiled down to its basic elements, this system describes an attempt to simplify and standardize the use of 35mm microfilm in aperture cards as a medium for the storage and dissemination of information in engineering data. Rather than distributing large engineering drawings with all their inherent handling problems, the DOD will send Filmsort cards with microfilm images of the documents to interested agencies. This will result in efficiency of distribution and have the additional advantages resulting from the automation features possible with these cards. In most cases, the end product will be electrostatic enlargements from the microfilm.

Taking a Look

When we look at the other end of the spectrum—at the field of research microfilming—we find that electrostatic prints from microfilm is also a hot topic. More and more of the orders that come in to library photoduplication departments specify that the microfilm should be made to xerographic standards. Pick up any issue of a library periodical and the chances are that you will find something on the subject of keeping out-of-print books in print with Xerox. Here again, we find the end product is electrostatic prints, with microfilm serving only as a medium of exchange between the original document and the paper copy.

Reading Machines

Does this mean that microform reading devices — reading machines to most of us — are no longer needed and no longer a subject of interest? Many microfilm users would probably hope so. It is at the reading machine that the average individual first faces the reality of microphotography. It is when they have to show their clients how to use his optical device, that most librarians develop a distaste for the medium. The accession, classification, storage and distribution problems of the microform are merely variations of problems that the custodian faces with other materials in her library or records department. Reading machines are rarely designed so that their first echelon maintenance is as simple as it should be. They are often hard to clean and require an engineering degree in order to change the light bulb. There is no reader available in this country that will handle both microfilm and micropaper.

Reading machines will be with us for some time to come, and their study will continue. Librarians began to specify what they wanted in microfilm reading ma-

continued on page 38

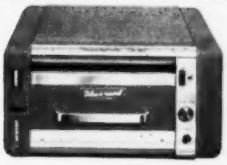
Remington Rand

FILM-A-RECORD®

microfilming systems and equipment

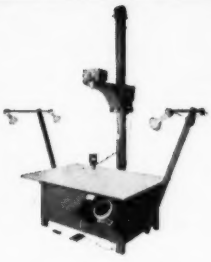
for all your business photography needs!

FILMING



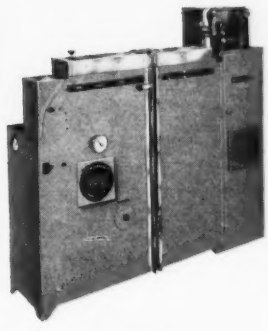
CHAMPION (16 & 35mm)

ARISTOCRAT Dual (16mm)



F36.1 Planetary

PROCESSING



UNIPRO

FILING

UNI-KARD

Jackets

READING

Engineering Reader

Electronic Reader

Modern businesses of every type and size are discovering how successfully REMINGTON RAND FILM-A-RECORD Microfilming can save valuable time, space and money in their recordkeeping operations. For the filming, finding, storing, housing, protecting, controlling and reproducing of business records, here is the most comprehensive line of cameras, readers and processors available.

Send this coupon today!

REMINGTON RAND FILM-A-RECORD
MICROFILM SYSTEMS & EQUIPMENT

Remington Rand
DIVISION OF SPERRY RAND CORPORATION
Room 1708, 315 Park Ave. South, New York 10, N.Y.
I want more information on:
CAMERAS ☐ PROCESSORS ☐
UNITIZED FILING ☐ READERS ☐
Name & Title_____
Company_____
Address_____
City_____ Zone_____ State_____
2

Circle No. 515 on Post Card

The Photomemory Phenomenon

Microfilm plus electronically-stored memories promise management a new information processing system.

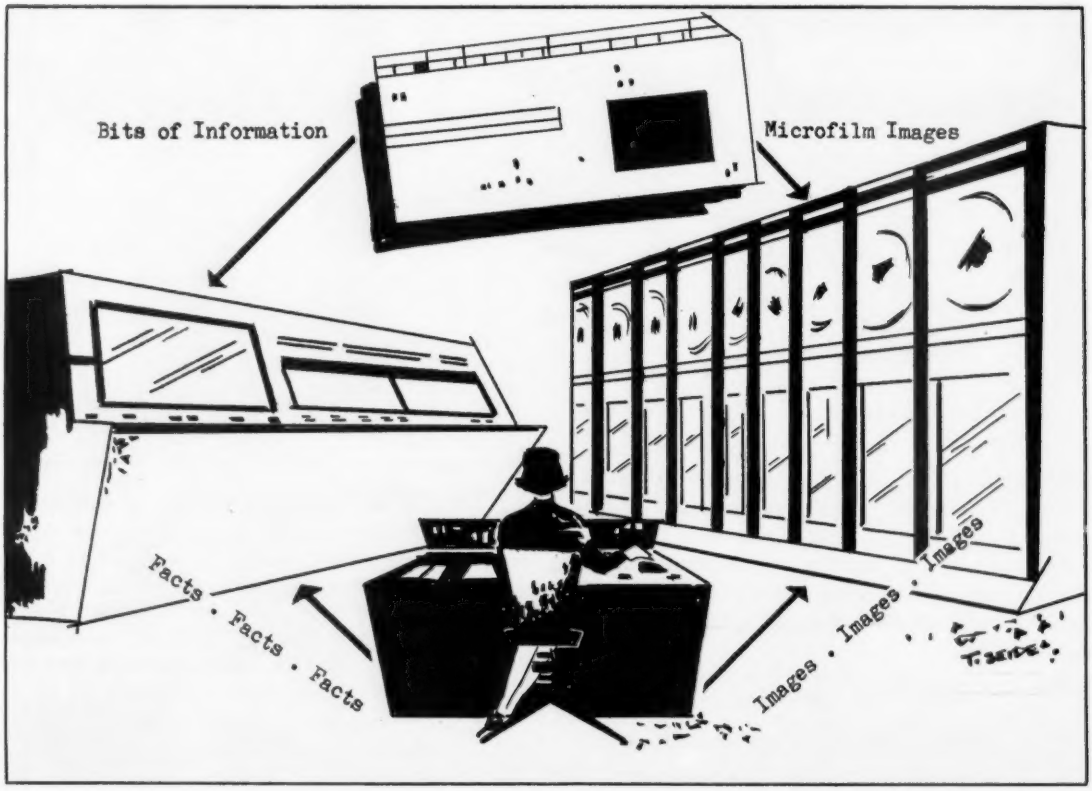
by ROBERT A. SHIFF
President, Naremco Services, Inc.

The day of high-speed photomemory units — the integrated data processing concept that marries microfilm images to electronic computer memories — is now on the horizon. The technology exists: all that remains is the development of machine configurations adapted to current image processing needs.

What will the new dimension represent? It represents a system that will be able to answer simple English queries — or rather display images of all source documents needed for a complete answer — within a matter of seconds. Instead of storing great quantities of facts and figures alone, a computer memory can be used as the master index for the information contained in photomemory. A request to the computer will activate automatic selection techniques.

How will the photomemory units operate? The unit will not require the use of conventional roll film which must be manually searched, but will serve as a photo-image memory unit the same way that a magnetic drum serves as a "bits of information" memory unit. You interrogate a magnetic drum and get bits of information read back to you. In the same fashion, the photomemory unit will be interrogated and produce an entire image at comparable high speeds. At the same time the photomemory system will provide a security film by-product — at the point of input, one copy of the image can go into memory and the second copy can be recorded on a roll of film which is sent to a distant location for security purposes.

What will the photomemory units be able to do? Photomemory or image processing (as against digital processing) will be able to handle graphic material that is not readily adapt-



Meet the Author

Robert A. Shiff is President of Naremco Services, Inc. (National Records Management Council), a leading management consulting organization specializing in paperwork management, information retrieval and the application of advanced systems.

able to the information retrieval capabilities of present computer systems. Much information cannot be effectively or economically translated into "bits of information." To be useful it must be preserved in its original form or a reproduction of it. For example, legal documents have signatures and seals and certain other characteristics of authentication which cannot serve as input to data processing equipment. Similarly maps, photographs, charts, and drawings have line configurations that must be preserved intact. Vital statistics records such as birth, marriage, and death certificates all lend themselves readily to mechanized photomemory which could produce authenticated copies on demand. Imagine for a moment a vending machine in the City Hall. A person inserts coins, types a few words of identifying information, and out pops a certified copy of their birth or marriage certificate.

Other Possibilities

Going further, one can see the possibility of image-processing life insurance policies and medical information bureau files and relating the two in photomemory. In the credit information field, photomemory can store related information on risks and produce copies on demand. In the library area, technical libraries and newspaper morgue files are brought to mind. Complex indexing and many descriptors are required, including multiple pages of documents, photos and cartoons. In the educational field, the possibility of combining image-processing with digital processing to maintain complete student information for future transmittal to colleges and employers is near.

In all of these areas there are too many factors, too many individual details, each of which affects the final decision and each of which is not successfully convertible to a digital system. The photomemory unit will handle these documents by offering totally automated image-retention and retrieval just as present EDP systems offer digital information retention and retrieval.

In what ways will photomemory units be an advance over present EDP and microfilm systems? EDP's major drawback is that it best handles "bits of information," not graphic images. Microfilm, on the other hand, has had problems in adding to and deleting documents from a file, in producing fast hard copies and in both indexing and random access. These problems are being individually studied and solved by equipment manufacturers. However, it is in adding electronic computer memory ability for the immediate addition or removal, location and reproduction of graphic records that we begin to approach a complete data processing system. Electronic computers will handle the routines and the condensation of masses of simple data into meaningful information and, at the same time, provide the ability to handle an entire document in a manner comparable to a single "bit" of information.

Equipment is now available that uses film for high speed printout of graphic material from the face of a charactron tube. The preparation and calculation of the 1960 census combines the use of microphotography and computer equipment. Census forms containing machine sensible language (mark sense) are photographed on microfilm. Data on microfilm are then read by a film optical sensing device which translates mark sense to the common language (on tape) of a computer and serves as direct input. This method of direct input completely by-passes the need for extensive key punch operations. The configuration of system and equipment now in use for preparation of the 1960 census represents an important guide post for processing other large scale paperwork operations.

What about conversion? The most judicious approach is to think in terms of "building blocks" — utilizing, where possible, existing equipment and materials, instead of complete replacement. Many companies already have key punch machines, sorters and tabulators. They have computers — small, medium and large scale — and much of their paperwork has already been programmed into these machines. As new equipment components are added it is well to maintain flexibility to absorb future equipment expansion.

Looking Ahead

The future lies in the area of combining data processing with image processing. The identifying or location code of film images could be tied directly into existing data processing equipment or combined with the film image file, depending upon the requirements of a specific application.

Forward looking companies are preparing now. A number of companies are now taking a new look at the studied use of microfilm equipment. Microfilm

continued on page 36

CARD is sorted according to seven press designs.

Remodeling a Retrieval System

Obscure parts drawings now available on short order at printing press firm.

INSERTING Duplicard in Filmac Reader-Printer gives immediate view of drawing.

ENGINEER returns to board with microfilmed print, thus completing retrieval cycle.

Microfilm has changed The Miehle Company's way of life considerably. B. M. — "Before Microfilming" — retrieving an engineering drawing from the Chicago printing press manufacturer's vaults was a time-consuming, money-costing headache. Today it is practically no task at all.

Miehle's engineering policy has long emphasized multiple use of parts and sub-mechanisms in product line design. However, as new products and models were added through the years, it became increasingly difficult to retrieve past drawings of parts in order to make full use of paid-for engineering time to obtain maximum effectiveness of present engineering time and talent. It reached a point where it cost less in terms of both time and money to make a new part drawing than to search for an old one. Of course, this procedure added to tooling and inventory problems.

Old Methods Replaced

About three years ago the company decided to invest in the equipment necessary to replace manual retrieval methods with a fully-mechanized filing and retrieval system based on microfilming, Filmsort aperture cards, and electronic sorting equipment. Today an IBM data card operation within the engineering department enables engineers to

have exact copies of original drawings in their hands, for reference or change, within two to five minutes after mechanical sorting of data cards is finished.

Drawings are classified by product, mechanism, part, material and process. Two aperture cards are made of each drawing, one for immediate reference and a second for maximum security.

Card-Coding

After filming, the original drawing is delivered to the key punch machine for card coding. In addition to the two aperture cards for films, a third card, containing no film, is also punched to serve as the information card for use in the sorting equipment. This third card is color-coded for the seven basic products to simplify sorting.

After card punching, the original drawing is returned to the vault file, and the data card is sent to the sorting machine trays. The master and security aperture cards are sent to the film mounter for film mounting.

After film mounting, the master card is filed in straight drawing number sequence in a locked file in the drawing vault. The master card containing the microfilmed engineering drawing then becomes a direct substitute for the original drawing in those instances where the drawings were used for reference purposes. The security card is stored away from the plant for maximum security.

Sorted by Parts

Retrieval of data with the IBM electronic equipment is fast. For example, a design under consideration requires the use of a spur gear. The use of an existing part in the new design will save engineering drafting time, tool cost, new production and inventory record costs. Data is sorted by part identity to find gears, a second sort to find spur gears.

Using the sorted cards for drawing number reference, the master card is located in the vault microfilm file and a Duplicard is made. Since the master file is always intact and complete, time spent looking for drawings is eliminated. Duplicards are made for reference purposes, rather than removing the master card from the vault, to insure a complete correct master file.

DRAWINGS are double-checked by clerk at time punch cards are made on the key punch. Numerical sequence is not disturbed from the time originals leave the vault until they are returned.

Quick Duplicate

With a Duplicard in hand, the engineer can get an 8½ x 11″ or 18 x 24″ print within a few seconds on a "Filmac 100" or "Filmac 200" Reader-Printer by merely inserting the card, pressing a button, completing the retrieval cycle.

A changed drawing is processed in exactly the same manner as the initial release of a new drawing. A changed drawing requires an added procedure, namely the purging of the master and data card files. The master card is purged manually without difficulty since it is maintained in straight numerical order by drawing number. Dependent on the specific situation, data cards are purged manually or mechanically at the sorter.

"In actual practice, our microfilm program has two distinct areas of activity," says C. W. Schmidt, administrative engineer. "One area uses the film portion of the master aperture card as a reference tool, while the other area uses the "sort" side by making punches in the data card. These answer problems that directly affect the overall productivity of the engineering department.

"Our purchasing and inventory problems are greatly reduced since we now find it easier to relate material needs to the parts inventory—something never before possible."

Cost Decline

Overhead labor costs in the department have been steadily decreasing, and Miehle is enjoying more utilization of design talents from workers. Productivity has been consistently improving.

"Our present program is only the first step in applying microfilm and related data processing equipment to engineering procedures and methods. We feel there are hundred of possibilities ahead," Schmidt concludes. □

SHOP FABRICATION orders are studied by Robert L. Stewart (left) and Frank Heylin of American Bosch.

MOS Means More $$$$

Random access EDP system is answer for Arma.

American Bosch, a division of American Bosch Arma Corporation, is applying Management Operating System (MOS) techniques for an estimated savings of $120,000 a year in production costs. A random access data processing system is the tool with which production costs are being slashed in a scientific approach to material and inventory control.

The new system was developed to automate planning and scheduling of piece part material control. It is carried out by an IBM RAMAC 305 system without human intervention and is designed to handle operations involving 100 to several thousand parts. Planning for the system began six years ago according to C. W. Perelle, president of American Bosch Arma.

"At that time we began an extensive modernization program of our manufacturing and product distribution facilities that cost more than $5 million. The effect of this program was soon felt throughout the organization, particularly in the manufacturing control and administrative functions, where punched card equipment had been used effectively for some twelve years. We felt it necessary to have a data processing system sensitive enough and fast enough to react to our modern factory and distributing facilities. We need management reports as soon as possible to insure that we are getting the best return on our new facilities and that we are offering our customers the best possible service. The new system is a result."

The system is activated daily at American Bosch. A single punched card puts into motion the complete processing of a production schedule order. Accepting the card, the computer scans a magnetic disk file containing 10 million characters of information and establishes the time relationships needed to obtain or produce each component of the finished product. Within three minutes, the computer can determine the effect of the order on all 15,000 parts which go into 1,000 American Bosch end products. Components are allocated from stock or scheduled for production in econo-

mical quantities by the RAMAC 305.

Essentially, input to the computer in punched card form consists of all production schedules, service requirements and engineering changes. Processing internally by the computer includes converting production schedule orders to requirements by manufacturing dates (M-Days), measuring requirements against stock on hand and on order, determining the necessity of preparing shop orders by M-Days, determining the necessity of preparing purchase requisitions by M-Days, evaluating Economic Ordering Quantities, and cancelling and/or rescheduling unreleased shop orders. Output, prepared by the computer, includes shop orders by M-Day, stock planning status reports, periodic evaluation of optimum inventory levels, and suggested changes in or cancellations of open purchase orders.

How does this data processing system save money for American Bosch? Company executives cite these major factors:

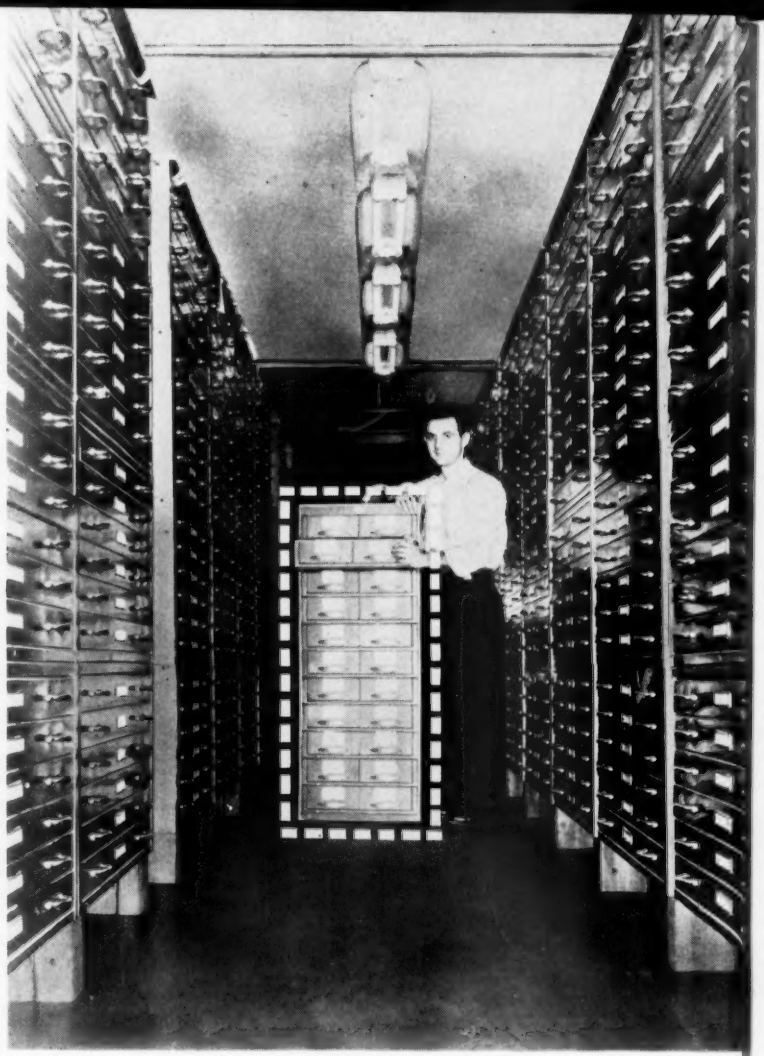
— With automatic control of Economic Ordering Quantity procedures, the number of shop orders processed each year is being cut by 4,000. It costs American Bosch $30 to prepare an order.

— As a byproduct of this reduction, machine setup costs — which range from $20 to $100

continued on page 36

RAMAC 305 receives punched card for automatic processing.

DATA is punched on cards (foreground), and then cards are fed to RAMAC system in center.



IF ENGINEERING DATA for a single Air Force plane were submitted in full-size reproducibles, it would fill all the filing cabinets that surround T. C. Meyers. A single file of aperture cards serves the same purpose.

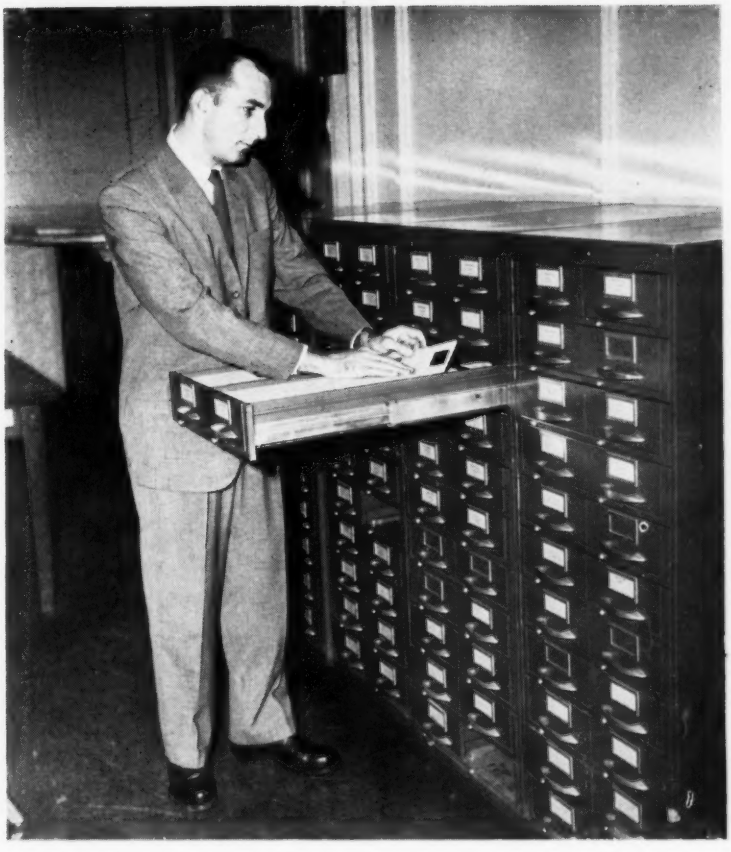
Changeover in Air Force data distribution policies saves money for the nation's taxpayers.

Out of the Paper Business

In a move producing substantial benefits for taxpayer, government and contractor alike, the Air Force has changed its engineering data distribution policies and procedures. Henceforth, such data will be distributed throughout the military departments by the use of 35mm microfilm mounted in punch cards rather than prints and full-size reproducibles as heretofore.

This move has taken the prime contractor out of the paperwork business and, as a result, reduced the cost of weapons procurement for the Air Force.

Under the terms of old Air Force contracts, a manufacturer not only supplied the weapon but also the engineering data as in the form of engineering drawing reproducibles and numerous sets of prints to both the Air Force and its field activities. A major weapons system may have as



DONALD ROTH of Directorate of Supply, Hq., Air Material Command, Wright-Patterson Air Force Base picks out right aperture card.

many as 50,000 drawings. Consequently, the contractor found himself furnishing 50,000 reproducibles plus as many as 1,500,000 prints — a small mountain of logistical paperwork. This paperwork was part of the cost of a weapons system.

Under contracts now being issued, instead of the weapons system manufacturer being in the business of distributing Air Force paper work, he supplies a master record from which the Air Force can make its own distribution. He is responsible for furnishing only five things:

1. A microfilm index.
2. A set of 35mm microfilm.
3. A punch card for each microfilmed drawing.
4. A set of punch cards for the entire item.
5. One punch card for each vendor item in an end assembly.

One Air Force representative estimates that with these five items, one dollar spent on microfilm and punched cards does the same job as five dollars spent on reproducibles and prints.

This changeover in Air Force procedures is called the Micro-Mechanized Engineering Data for Automated Logistics (MEDAL) Program. It is administered by the Air Materiel Command and is probably the largest aperture card program yet undertaken.

Air Force Makes Changes

The decision of the Air Force to change its engineering data distribution from prints and full-size reproducibles to microfilm and punch cards is a major one. The Air Force repositories at Wright-Patterson Air Force Base, Dayton, Ohio, contain between 7,500,000 and 8,000,000 reproducibles. Its monthly receipts of new and revised reproducibles average 75,000.

Over the first three-year conversion period, AMC will use approximately 90,000,000 aperture cards to replace full-size reproducibles and prints at the central repository and at the Air Materiel Areas, Air Force Depots and base commands. At these local levels, there will be additional distribution for localized functions.

The switchover is a big job, but it should prove worth the extra effort. In the old Air Force system there were some major weaknesses.

Lack Complete Distribution

Among these deficiencies was a lack of complete and correct distribution. The central repository might not have a complete set of reproducibles, while in the field, activities had prints that were not needed.

Another weakness was legibility of copy. Part of this problem was due to a lack of enforcement of engineering drafting standards at the contractor's level. Another part of this problem arose from variations in the quality of reproducibles submitted. Such variations in reproducible quality required photographic variations in exposure in making prints. Microfilm standards should eliminate or minimize this factor.

Under the old system, a shortage of space for engineering drawings brought on all the problems of improper housekeeping: misfiles, dog-eared and torn reproducibles, time lag in filing and distribution, and insufficient data.

The new system means that instead of having 250 conventional engineering drawing files plus stepladders for filing and pulling tracings, 250,000 aperture cards can be protected from damage in a single motorized file.

The punch cards and mechanical operations work a further space-saving by making possible an economical and efficient rec-

continued on page 35

3M Makes Microfilm So Easy to Use

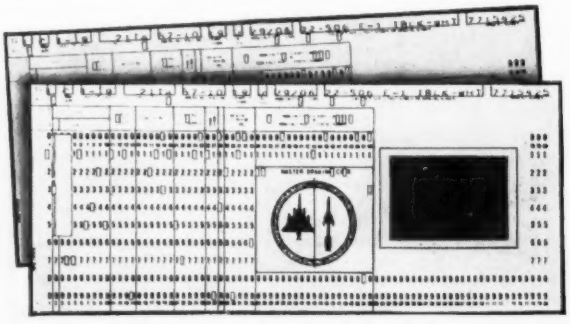
Industry-Proved 3M Microfilm Products Compatible with New Government Specifications, Speed Industrial Paperwork

In April, 1960, the trend to miniaturization and automation of engineering and related data leaped ahead with the release by the Department of Defense of the standards and specifications for its new Engineering Data Micro-Reproduction System.

Based upon, and compatible with, microfilm systems now being used by industry to speed industrial paperwork, the new requirements standardize the preparation and use of film, aperture cards, and eventually, equipment.

If you are now using microfilm for your engineering drawings and records, more than likely you will simply integrate the new requirements into your present system.

If you have held off instituting a microfilm program pending more information about the specifications, you will want your organization to familiarize itself with the new procedures right away. It's to your advantage because these new standards open broad avenues for control of industrial paperwork problems.



In any case, you can depend on 3M's industry-proved products to make microfilm so easy to use. Designed to meet military requirements, these 3M products raise marketing and production efficiency, and lower overhead.

FILMSORT Aperture Cards and "Duplicard" Copy Cards, long used by Government and industry, are designed to meet the specifications and standards for the Engineering Data Micro-Reproduction System. They standardize drawings and records. They consolidate pertinent data. They shrink file space. They speed retrieval of information. They simplify dispersal of needed facts. And now, to speed your use of FILMSORT Aperture Cards, 3M supplies both the printed card and the aperture. You save on shipping costs. You get your cards faster.

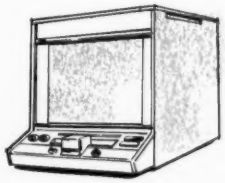
FILMSORT Microfilm Copiers, Mounters, and Readers are designed exclusively for FILMSORT Aperture Cards. They are engineered to make your micro-reproduction system practical.

THERMO-FAX "Filmac 200" Reader-

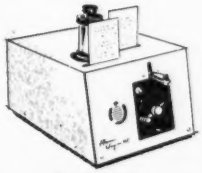
Printers combine the advantages of a reader and a printer in a single low cost unit. You can refer to the enlarged drawing on the huge viewing screen. When you want a print, just touch the button and in seconds you will have a clean, work-size copy—18 by 24 inches or 18 by 12 inches. With a THERMO-FAX "Filmac" Reader-Printer you can take more than a look—you can take a copy. Located at multiple points-of-use, the "Filmac 200" Reader-Printer will fit into your microfilm system perfectly. There's a new "Filmac 100" Reader-Printer, too, that delivers 8½ by 11 inch copies in seconds.

For complete information on how 3M makes microfilm so easy to use and details about the new Department of Defense microfilm standards and specifications, mail the coupon today.

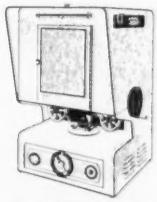
Modern Microfilm Products from 3M . . .



THERMO-FAX "Filmac 200" Reader-Printer

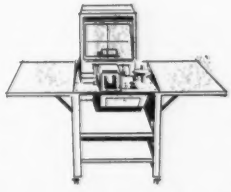


FILMSORT "Uniprinter" Copier



THERMO-FAX "Filmac 100" Reader-Printer

FILMSORT "Inspector 50" Reader



FILMSORT Semiautomatic Optical Mounter

3M COMPANY

MICROFILM PRODUCTS

THE TERMS "FILMSORT," "DUPLICARD," "THERMO-FAX," "INSPECTOR," AND "UNIPRINTER" ARE REGISTERED TRADEMARKS OF

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

ST. PAUL 6, MINN.

Minnesota Mining and Manufacturing Company
Dept. FBZ-70 St. Paul 6, Minnesota

Please rush me complete information about 3M Microfilm Products and details about the new Department of Defense specifications and standards.

Name_____

Title_____

Company_____

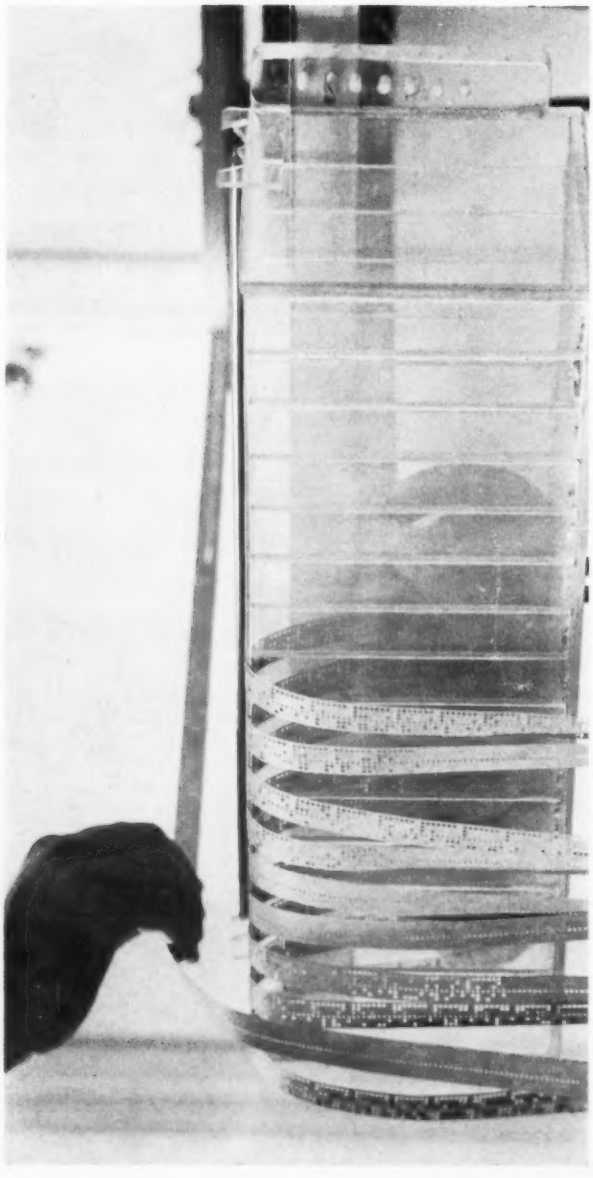
Address_____

City_____ Zone____ State_____

Circle No. 511 on Post Card

Modern Merchandising With EDP

Multi-store retailers channel punched tapes of sales to service organization and receive detailed analyses thanks to electronic computing.



by NELSON C. MARSH
Vice President and General Manager
Mountain Data Systems, Inc.

Retail chain store operators have always felt the need for comprehensive sales analysis information. Until recently it was not economically feasible for them to obtain weekly and monthly sales breakdowns of each department at their various outlets. The rapid growth of data processing programs, available to moderate-sized operations through service organizations, is now allowing the small fellow to benefit from EDP.

The chain store field offers a solid example. Retail chain management faces the typical problems of a rapidly expanding economy. They need accurate information for determining the re-allocation of department store space and for purchasing merchandise. Timely sales breakdown data is vital because it provides a background of fact that affects both purchasing decisions and store expansion programs.

Here is how a number of progressive organizations have adapted EDP methods to get this data.

The first step has been to install special NCR cash registers in every store outlet. Each register contains a paper tape recorder and the original sales entry data is automatically punched in paper tape simultaneously with the actual cash register transaction. After processing, these daily punched tapes provide the information needed for a continuous examination of sales progress and give management a vehicle for the immediate evaluation of the organization's overall sales strength. The sales analysis includes such information as (1) Geographic distribution of inventory by sales areas; (2) Department sales trends; (3) Existence of weak and strong sales areas; (4) Sales performance, by departments and by stores.

←TAPES from stores are spliced, then reeled onto spool and shipped to service organizations.

At each store, every bank of registers is under the supervision of a head cashier who is also assigned the responsibility of visually checking the paper tape punching mechanism of each register. Each roll of punched tape coming out of a register is matched by date and register number and noted on a daily cash report. Correction slips listing register number, department, amount and correction are attached to the daily cash report. This report is sent along with the tapes via air mail to Mountain Data Systems for immediate processing. Prior to shipping, the rolls of punched tape are inspected by the checkout supervisor who adds any pertinent comments on the day's operation.

▲ RE-USABLE containers assure safe shipment of punched tape records.

Splice Tape Together

Upon arrival in our office, tapes from each operating unit are spliced together end to end in cash register order, and reeled on a large tape spool. These are assembled on an individual store basis, and the roll itself is coded by store and dated. The tape spool is processed daily on a Bendix G-15 general purpose digital computer. We process approximately one half mile of tape each day, and reports are immediately dispatched to the retailers' executive offices. The sales analysis developed on a weekly and monthly reporting schedule in its entirety is prepared on the G-15 and a Bendix magnetic tape unit.

Reports Helpful

The sales analysis reports have proven to be an extremely effective management tool. They allow management to supervise the selling activity of an individual department or store, and to immediately detect weak sales areas. The report provides an accurate instrument to check department and, or, store turnover, and to compare one store's sales against another. In some areas, retailers have been able to spot and eliminate excessive selling time, advertising money and efforts being wasted on unproductive departments.

Another benefit of the system is the aid it gives in forecasting seasonal and local buying trends. This is extremely important to operations which do little or no warehousing. In addition, it is also helpful in maintaining an up-to-date record of layaways and returns. This is normally done on a department-to-department and store-to-store basis. A high department return record may suggest that a product is a poor seller and adjustments are necessary.

The sales analysis provides a direct check on the daily store cash report. Weekly and monthly store comparative reports, prepared as a by-product of the daily analysis, act as a basis for determining payments to concessionaires and for transfer of merchandise from one store to another. *continued on page 35*

▼ BENDIX G-15 digital computer processes continuous roll of tape.

SUPERVISORY control panel is nerve center of Harris Trust EDP system. Harris is nation's first bank to install a large-scale data processing system which handles its entire checking account operation as well as 25 stock transfer accounts.

Electronic Banking Services

Harris Trust is the first bank processing checking accounts with a computer.

About seven years ago the top executives of the Harris Trust and Savings Bank of Chicago took a good hard look at their institution and realized that it was caught in a dangerous rising cost spiral, caused to a great extent by increasingly complex and voluminous paper work.

The Harris Bank is one of the nation's largest commercial banking, savings and trust institutions. The men who have put it in its high place, naturally, are men keenly aware of what's new and best in management methods. Therefore, it was not unexpected that they should be cognizant of the accelerating accomplishments of computers.

So to meet the bank's problems head on, an "in-plant" team of management experts was organized to survey the institution's various operations and determine whether or not a computer system could effectively *and economically* cope with whatever bottlenecks were found.

Checking Account Activity

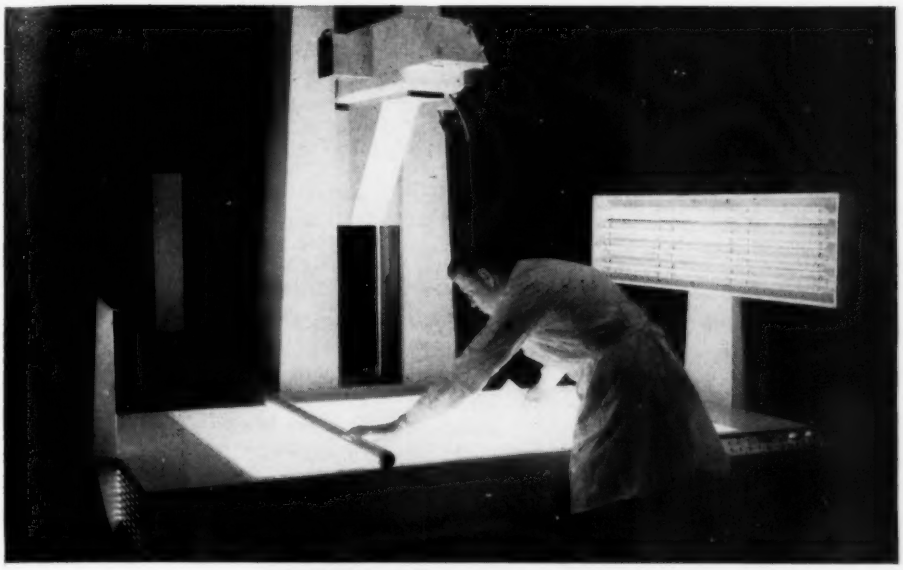
The first operation to get the computer treatment was the processing of checking account activity. This activity was increasing at such a rate that if the data arising from it continued to be processed in the usual way the cost of maintaining the activity would become intolerable and the whole operation might be smothered by the paper involved.

It became apparent to the study group that salvation lay in having a computer system handle the data processing. After studying existing computer facilities, the group settled on Remington Rand's Univac II system.

The facility was set up on the seventh floor of the bank, after an ingenious partnership arrangement had been worked out between Remington Rand and the bank. Under the terms of the agreement, Remington Rand continues to own the equipment. Harris rents it for the peak eight hours of the day. During the rest of the time, Rem-Rand uses the facility as its Chicago Service Bureau.

The specially trained computer force is divided into seven teams: a supervisory group, four programming teams, a team to handle the details of account numbering and, for an interim period, a

continued on page 26

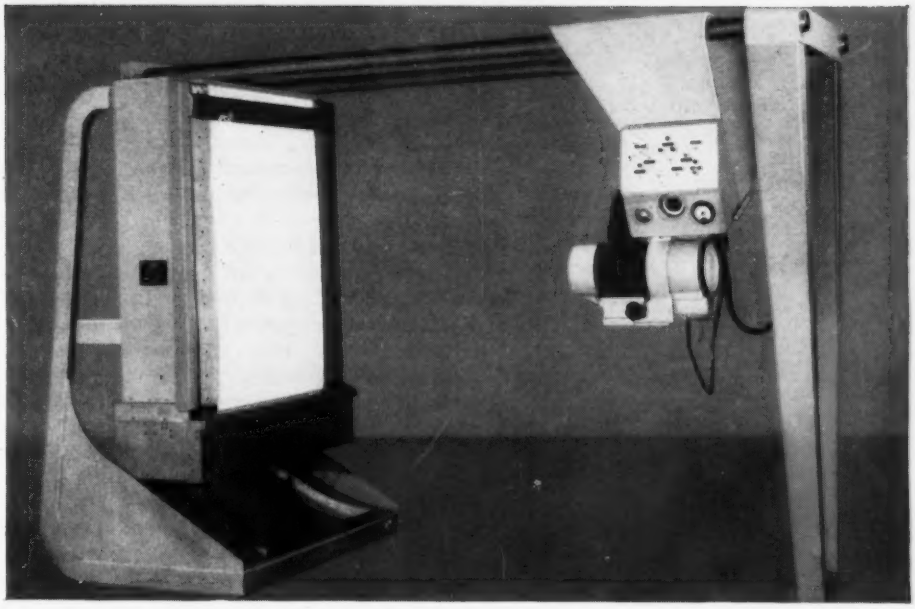


MICRO-MASTER®
105/35mm
Camera-Projector

A new K&E exclusive combines the two important miniaturization systems—105mm and 35mm—in a single, compact unit, permits tailoring of reproduction to the exact requirements of each job. Camera and projector are combined in a single overhead assembly with interchangeable magazines. Operator can shift from camera to projector, 105mm to 35mm, roll to sheet film, black and white to color ... in seconds!

KECOFAX®
105/35mm
Projector-Printer

Now, for the first time, a unit that produces sharp, permanent, *work-size* electrostatic prints up to 34" x 48". From exposure to print in *40 seconds*. Delivers as many as 19 prints automatically. Process completely eliminates wet processing. Direct exposure onto electrically charged paper forms a latent electrostatic image by dissipating charges in the light struck areas... passage through toning and fusing chambers forms and permanently fixes a visible image.



2 Dynamic New Developments in Miniaturization of Engineering Drawings

Maximum performance and flexibility are yours in these new K&E units...

Miniaturization takes on a new dimension with the introduction of these two new K&E units—the basic components of a complete reproduction system engineered by K&E to provide maximum speed, accuracy and *flexibility* in miniaturization of engineering drawings.

For use in conjunction with your present equipment, or as the foundation of a complete new system, the MICRO-MASTER 105/35mm Camera-Projector and KECOFAX Projector-Printer working together provide both 105 and 35mm negatives and all sizes of prints required from full-size to any reduced size. Incorporating dozens of outstanding engineering firsts, these units represent an entirely new concept in effortless, *full-range* miniaturization...

For further details on these new K&E units, and the complete line of MICRO-MASTER and KECOFAX miniaturization equipment, send us the coupon to the right.

KEUFFEL & ESSER CO., Dept. DP-7 Hoboken, N. J.

Please send me complete information on the ☐ MICRO-MASTER® 105/35mm Camera-Projector, ☐ KECOFAX® Electrostatic Projector-Printer, and allied Miniaturization equipment by K&E.

Name & title_____

Company & address_____

KEUFFEL & ESSER CO.
NEW YORK • HOBOKEN, N. J. • DETROIT • CHICAGO
MILWAUKEE • ST. LOUIS • DALLAS • DENVER
SAN FRANCISCO • LOS ANGELES • SEATTLE • MONTREAL

1519

Circle No. 509 on Post Card

BANKING

continued from page 24

team to develop, install and operate the input section.

Input preparation equipment consists of key punches with adding machines electronically linked to them. The account numbers and amounts of four checks are keypunched into one card. This is the only manual operation in the entire system and will in time be replaced by automatic input (Magnetic Ink Character Recognition devices). The Operations Research Division, headed by Vice-President Maurice K. Heald, is in the midst of a study to determine the best means of integrating into the computer system the new equipment to "read" checks directly from the documents. Univac will be able to assimilate this new function in less than a year.

Sorting of the information punched into the cards is done in the Univac. Proper audit trails are left in the tapes produced by the adding machines and in the reports produced as outputs from the computer runs.

With the great speed and versatility of EDP equipment, information from the checks and deposits is sorted into account order and in ascending sequence as to dollar amount. Accounts are located and account records updated at the rate of two accounts per second or, in terms of the number of items posted, at the average rate of 5½ items per second. At the same time, the Univac is also checking for stop payments and overdrafts, watching for drawings against uncollected funds, preparing a report of abnormal fluctuations in account balances, preparing a trial balance of all accounts whether active or inactive, and preparing for printing the customers' statements for the day.

Customers' statements are produced at a maximum rate of 600 lines a minute. They are printed by the Univac High Speed Printer in much the same format as the pre-Univac statements. □

105mm Speeds Jet Port

A versatile 105mm photo reproduction system is helping to speed progress on one of the biggest rush jobs in the history of American construction engineering — Dulles International Airport, Chantilly, Va.

Expected to be the largest commercial jet airport in the world at its completion, Dulles International, located 27 miles from Washington, D.C., had its conception in January, 1958. Target date for full operation is July, 1961, a span of only three-and-a-half years in which to finalize plans, award contracts and complete construction.

This time factor necessitated precise scheduling of every phase of the operation. The Federal Aviation Agency, in charge of the vast project, has utilized every modern device and system at its command in order to meet its endless series of deadlines.

One phase requiring split-second timing by the FAA is the continuous inviting of bids and awarding of contracts. Contractors, sub-contractors and materials suppliers exhibit great interest in Dulles International, not only because of the monetary size of the jobs, but because of the prestige involved in participating in a project of this scope. Since all bidders must receive copies of the engineering drawings upon which they will base their bids, hundreds of copies of each drawing involved in the new airport are required. Moreover, the copies must be available quickly and must be clear, workable drawings.

The problem, according to M. W. Hemphill, Deputy Chief of Dulles International Airport, is to produce great quantities of sharp reproductions of original drawings as quickly as possible. The situation was particularly acute on the main access highway, which involved over 300 original drawings, and the Terminal Building, which involved 80 different drawings. For the highway drawings, 200 copies were needed of each separate sheet. The Terminal required 250 copies of each sheet.

The Federal Aviation Agency has met every bidding deadline without sacrificing quality of prints by utilizing Micro-Master, a 105mm film system for viewing, reducing and printing engineering drawings.

Using Micro-Master equipment of a Washington, D.C., service company, Cooper-Trent, the FAA developed a unique, time-saving system for inviting bids. As Hemphill describes it:

"We carefully estimated the time required to complete drawings for each section of the road and the Terminal Building. To this we added the projected reproduction time on Micro-Master. This gave us the date when prints could be delivered to contractors.

"Working on this timetable, we announced invitations for bids four to seven days in advance in the newspapers. Thus, by the time the contractors put in their requests for drawings on which to base their bids, we had copies ready to send to them immediately. This procedure has saved many days in the letting of contracts. On a project such as this, where the deadline for completion is very close, every day is crucial."

Use of Micro-Master for reproducing drawings has introduced uniformity into what had been a potpourri of different sizes and media. On the highway job, some of the originals were rendered in ink and some in pencil. On the Terminal Building, various grades of tracing paper and drafting film were used.

Each original was reduced to a 105mm negative, and then blown back to half-size for prints. The prints thus became permanent copies of the originals. The negatives are for future reproduction, if more copies are needed, and for reference.

DOD Readies EDMS Program

New specifications for Defense Department microfilms will streamline its operation—and save tax money.

by ERNEST P. TAUBES

In the Fall of 1958 the Defense Department undertook a project that will eventually revolutionize the engineering drawing field from drafting to reproduction. Identified as EDMS-0009, the project was started to determine DOD requirements for engineering data microreproduction.

The basic drive behind the project was the fact that the various military agencies were using some fifty different documents for instruction to contractors and their own offices in the preparation and usage of engineering data for DOD projects. In addition, the need to interchange engineering data within the Armed Forces was growing with the increase in complex weapons systems and their supporting equipment. Compatability for data formats became imperative.

Although it is only partially completed now, the project's ramifications have begun to affect industry as well as government. The completion date is fiscal year 1962 at which time the Defense Department will have a completely unified plan for the handling, distribution and storage of engineering data, which will require that every supplier conform to the same standards.

During the last six months considerable material has been published in various trade magazines, speeches given at conventions and seminars conducted to acquaint the public with EDMS-0009. To date, six of the projects covered under the program have been completed and five of the six approved and issued. Specifically, the five which are now completed and issued as military specifications are:

(1) MIL-M-9868. 35mm requirements for microfilming of engineering drawings.

(2) MIL-M-9879. 105mm requirements for photographing of construction/architectural drawings, maps and related documents.

(3) L-F-00315. Diazo-type microfilm.

(4) L-F-00330. Heat developing 35mm photographic microfilm.

(5) L-F-00334. Black and white microfilm.

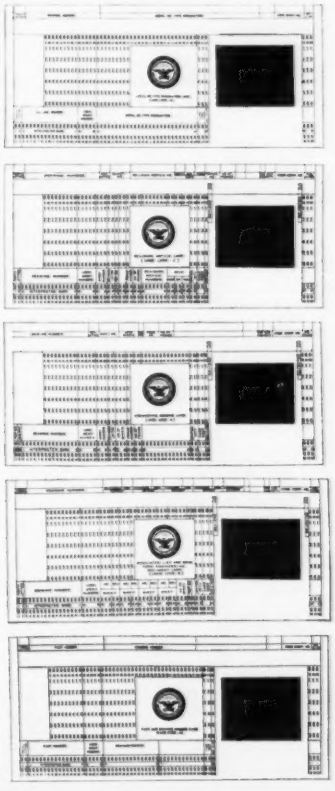
What Do They Specify?

MIL-M-9868 specifies a standard *frame size* to be used: 1-¼″ in width and 1-¾″ plus 1/16″ minus .000″ along the length of the film. It also standardizes *reduction ratios* at 16 or 20X, 24 and 30X. Documents up to 17″ x 22″ ("C" size) can be reduced to the former size, depending on the requirement of the procuring agency; 22″ x 24″ ("D" size) and 11″ x 34″ ("T" size) must be microfilmed at 24X reductions and all other sizes either in one exposure or in sections at 30X. This specification also requires that the background density of the microfilm images be maintained with limits of 1.0 and 1.2, that images shall be spaced 2″ plus 1/16″ minus .000″ apart, that the image resolution shall be 4.0 at 30X, 4.5 at 20X, 5.0 at 24X, 6.3 at 16X. Only one step of deterioration shall be permitted for each successive generation.

This specification also specifies the placement of the documents to be microfilmed, the resolution chart test target positioning and type of resolution chart to be used, the reduction test strip, microfilm roll identification and identification numbers and the inspection procedure that government inspectors have to follow in inspecting microfilm submitted to the government.

continued on page 38

NEW DOD aperture card formats.



CLERK makes a duplicard from a master microfilm aperture card for distribution to the engineering departments where it will be used for reference work.

Heald Lops Off Printing Time

Photocopy installation breaks blowback bottleneck at New England engineering and manufacturing company.

Microfilm printing time has been cut from hours to minutes at the Heald Machine Company through the installation of automated photocopy equipment. This is an important step forward for this Worcester, Mass., manufacturer of grinding and boring machines. Because of the nature of their work, Heald's engineers frequently have to call for full-size blowbacks of drawings which exist only on microfilm. They used to have to wait four hours for an enlargement produced by a wet-print method; now they can have one in eight minutes.

The unit which has done the job is a modified #4 Photostat machine. The manufacturers of the Photostat machine supplied a Microtronics enlarger for use with 16 or 35 microfilm originals. It is above the engineering board of the Photocopier. The film aperture card is inserted in the enlarger head. The operator pushes a button and—presto!—the exposure is made, the right length of Photostat paper, Type "W", is cut off from the roll, and the copy is developed, fixed, washed and dried.

Focus Once

It is necessary to focus only the first time a frame is reproduced. The time and light factors are recorded on the aperture card and all future blowbacks conform to the instructions.

The enlarger can be adapted to project roll as well as cut film. Reproductions up to 18 x 24 inches can be obtained.

Complete System

The value of this machine can best be understood in the light of the complete Heald storage and retrieval system.

Heald's drawing storage vault has a capacity of 250,000 tracings. As new tracings are stored, older ones are selectively destroyed. But before they are destroyed, they are microfilmed on 35mm frames which, in turn, are placed on Filmsort aperture cards for ready reference. The microfilm aperture card, thus, becomes the sole source of reproduction for the older drawings. When a print is needed, the microfilm card is retrieved from the files and enlarged to the required size. The Photostat machine has closed the time gap in this system and by so doing has saved Heald considerable money. □

It's Form that Counts

Paperwork makes or breaks the system so it is vital that systems planners give prime consideration to the design of all forms

by MILTON REITZFELD
Director, Management Assistance
Third Naval District, U.S. Navy

Today there is available a quantity of office equipment designed exclusively for capturing data at is source that is large enough to fill a folio-size volume. New items are being added at an ever accelerating pace. This hardware runs the gamut from simple, inexpensive, pocket-size hand-operated devices to sophistimated, room-sized machines.

They all have one common aim: rapid, accurate and economical production of human or machine readable documents for management information and control. And it is this paperwork —be it initial, intermediary or end product—that makes or breaks the sysem. It becomes mandatory, therefore, that systems planners give prime consideration to the design and content of all records in a given data flow.

PREPRINT INFORMATION

All known information required to be shown and used in a system should be preprinted and prepositioned on all procedural documents. This simple precaution is the fastest, most economical way of recording usable data. However, obvious as it seems, it is ignored frequently or only partially employed.

The result then is the repetition of similar data on different documents. This repetition has become the bane of administrators. It is a major cause of the high cost, numerous errors and delayed transmission of management information to points of decision and action. To avoid these pitfalls, records design must take into account the following factors.

FOUR FACTORS

Necessity of the form: Too many unnecessary records already clutter up out information channels. Why mechanize data already available in other documents? First, explore every avenue for eliminating or merging records.

The preparation device: Detailed knowledge of the available features of all office equipment involved is of vital importance. They affect the horizontal and vertical space requirements of procedural documents. Such matters are involved as the number of characters and lines to the horizontal and vertical inch, automatic feeds, continuous feeds, form construction. Space must be allotted for secondary and tertiary recordings of data and machines to be used.

Sequencing of data: The arrangement or delegation of information location in a document can be likened to the layout of work areas or the delegation of duties. Data must be located for maximum compatability with reference usage. If a form is referred to by more than one department, all data for each department should appear in one continuous area or zone. Failure to departmentalize in this manner may result in increased reading and processing time. The need for such zoning must be integrated with the requirements for having certain information appear on subsequent forms in the same sequence.

SEQUENCING VITAL

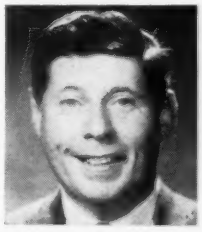
Sequencing of information not only affects the design of records but also the programming of input media such as punched paper tapes, tabulating cards and punched tags, etc. Planners must pay close attention to tabular, marginal and overall spacing controls. For example, should they be built into the input media or left to operator control? Proper programming affects processing speeds, utilization of machine and operator time.

Motion Analysis: The most common SDA equipment is the electric typewriter that reads punched paper tape or tab cards, automatically types hard copy,

continued on page 31

About the Author

Milton Reitzfeld has spent the last twenty years as a consultant to industry and government in the fields of information systems and records management. He is a frequent lecturer at professional conferences and has authored various articles on new developments in the field.



MULTISORT UNIT is used to sort media to await their out-posting date.

Save the Space For Selling

Microfilm frees filing area for sales activity of Nebraska department store.

by WILLIAM D. ROBERTS

Comptroller
Gold's of Nebraska

The essence of success in a department store is sales space, and space can't be used effectively for selling if it is filled with files and records. That is why microfilming has become so important in the operation of Gold's of Nebraska, in Lincoln.

Here it has further simplified the modern practice of cycle billing the ever-growing number of accounts operating on three different charge plans, and has enabled us to save large amounts of floor space, to greatly simplify our procedures, and to eliminate the need for at least four workers.

Most important, it permits us to keep up-to-the-minute with some 50,000 accounts. We are able to give S & H green stamps on charge purchases when bills are paid before a regular deadline — a deadline that comes on 24 different days of the month for different groups of customers.

We have an average of 4½ pieces of media per account per month. That means that if all those media had to go into files, they would accumulate at the rate of 275,000 per month or 3,300,000 per year. We would have to keep them for five years in such order that they could be located quickly when needed.

Save Floor Space

Before going to microfilm, we had three huge bays on one floor full of these records. That space now is free for the cycle billing desks, which occupy only a fraction of the space. Our permanent records on all sales since 1950 are in one microfilm storage cabinet that occupies only about four square feet of floor space.

Microfilming has increased efficiency in our company by enabling us to send the actual sales slips to the customer with the statements. Previously, we had to keep these on file for five years because customers sometimes forget their purchases. When they received statements they had to call frequently, for their own clarification, to find out just what items they had purchased and when.

Send Customer Slips

Now we keep these sales slips in our files on films, and send the actual slips to the customer with the statements. If they question the figures on the statement they can check the slips and see precisely what they bought, when they bought it and the price.

Before we installed this equipment four clerks worked full time between the telephones and the files — checking sales slips in response to customer queries. Now, customer queries have decreased so greatly that all four of those clerks have been assigned to other jobs. The queries we do get are handled routinely by others in the office.

The flow to the camera works like this: Our 50,000 accounts are broken down into 48 control dates, which we close out on 24 billing dates, two controls per billing date. Trays containing the sales slips are taken to the bookkeeping machines. As the media go through the machines they are posted on customer statements according to type of charge accounts, and the media with statement drop into a bin.

At this point the microfilm camera takes over. Its high-speed automatic feeder picks up the varying types of paper found in sales slips, credit memos, cash slips and other media — even when their edges are not completely tight and regardless of the varying consistencies or textures of the paper. There is little chance for error in the filming because of the warning signal on the camera. This also sounds if camera is improperly loaded. □

EDP IN ACTION

continued from page 29

and produces by-product or select tapes. With accessory equipment it may even produce select tab cards. In connection with these automatic typewriters, motion analysis should be performed (breaking down the typing motion into weighed steps) to discover what forms are best suited for automatic typing—i.e. provide the least required time and effort by the operator.

Other Factors

In addition to the areas mentioned, there are many other factors that must be considered before the design and preparation of forms. Space does not permit more than a mere listing but this should not be taken to mean they should be regarded lightly. Some of these factors are:

Who will read or use the form? In the organization? Outside?

How many copies will be required?

How will the form be filed? By whom?

How many times will it be prepared annually? Total number of copies?

How long will it be kept? How often referred to?

Will it be the basis for preparation of other records? What kind?

How will the form be transmitted: Mail? Air Mail? Messenger? Electronic?

Will it be placed in an envelope? Regular? Window? Other?

Will it be folded by hand or machine?

How will the form be reproduced? Printed? Offset? Mimeo?

How will the information be recorded: manually in pencil or ink? Typewriter? Automatic typewriter? SDA equipment?

What will the physical characteristics of the form be in terms of size, weight, color, carbons, serial numbers?

Final Considerations

Finally, there is one more important consideration. Although the trend in forms design and processing, as in everything else, is toward maximum automation, management utilization of forms is still strictly in human hands. Therefore the paperwork must be atractive, concise and immediately revealing. There is a definite psychological aversion to the handling of unattractive records. They are the last to be picked up and the first to be put down. □

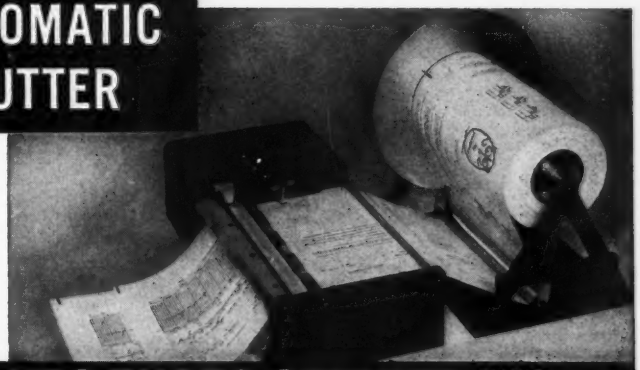
eliminate photo duplicating and print cutting problems with...

The 12-inch High-Speed BLOCK AUTOMATIC CUTTER

The most efficient method for cutting strip-processed rolls of paper. This completely automatic, labor-saving electronic cutter combines all the outstanding qualities of previous models PLUS these new features.

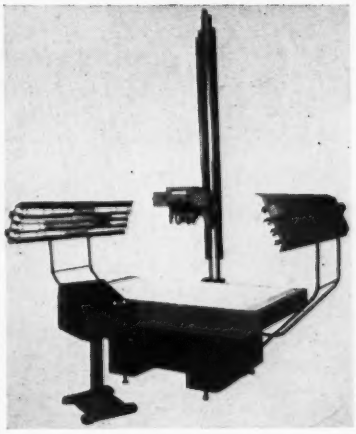
- **Cuts up to 40-feet per minute**
- **Accommodates paper up to 12-inch width and weights from 20 lbs. to 120 lbs. card stock**
- **Spool holds roll of paper 13-inches in diameter**
- **Operates on 110-volts, 60 cycle, AC current**

Used by leading photo finishers, state motor vehicle bureaus, banks, libraries and government agencies since 1950.



ALVES PHOTO SERVICE, INC.
Established 1916
14 Storrs Avenue Braintree 84, Mass.

Circle No. 501 on Post Card



MODEL NO. PD1088
35MM
PLANETARY CAMERA

KEYSTONE IN THE DEFENSE DEPARTMENT MICROFILM PROGRAM

. . . The Only Camera Designed Especially for

ENGINEERING DRAWING

— COMPARE THESE FEATURES —

- REDUCTION CHANGE by push button operated electric motor, up or down
- LENS highest quality
- FOCUS automatic

— THE ONLY STANDARD CAMERA EQUIPPED WITH —

- OVERHEAD AND BACK ILLUMINATION
- SUCTION COPY HOLDER to hold wrinkled and folded subjects flat during exposure
- DETACHABLE TAKE-UP MAGAZINE with built in cut-off knife

PHOTO DEVICES, INC.
ROCHESTER 8, NEW YORK

$5,750.00 FOB ROCHESTER

Circle No. 512 on Post Card

Yours for the Asking

New free literature on the latest developments in the data processing and microfilming fields. Each item listed has a key number. For more information circle that same number on the Readers Inquiry Card.

Systems

Microfilm Article 203

Minnesota Mining & Manufacturing. Reprint of an article "Let's Take a Positive Look At Microfilm" which decribes microfilm's uses in industry.

Planning a System 204

Charles Bruning. A guide titled "Basic Microfilm Indexing and Filing Techniques" tells how to achieve maximum results from a microfilm system.

Data Processing 206

National Cash Register Co. Booklet on integrated and electronic data processing describes equipment which is designed to simplify office automation.

Data Systems 207

American Data Systems Division. Folder describes data systems and tells when and how they can be used.

Commercial Loan Accounting 208

International Business Machines Corp. 24 pp. manual covers each phase of a Commercial Loan Accounting operation and contains card and report forms used.

Microfilm Cameras & Readers

Universal Reader 210

Documat, Inc. Description of a microfilm reader for both roll film and unitized film.

Camera-Projector 211

Keuffel & Esser Co. Bulletin on the Micro-Master, the only combination camera-projector for both 105 and 35mm.

Microcard Reader 212

Microtape Filing Systems. Sheet describes new compact Microcard Reader which greatly expands the usefulness of Microcards.

Microfilm Reader 213

Erban Products, Inc. Flyer on enlarged version of portable reader for micro-records of newspapers, financial records, maps.

Magazine Camera 214

Photo Devices. Data on the model PD1100, a 35mm microfilm camera with removable magazine and 100' capacity.

Portable Microfilmer 215

Recordak. Flyer with colored pictures plus data on the Recordak portable microfilmer with a 20 to 1 reduction ratio.

Microfilming Information 216

The Gevaert Co. of America, Inc. 28 pp. booklet gives valuable information and technical data about microfilming.

Computers and Accessories

Univac III 217

Remington Rand Univac. Data on the Univac III, a data-processing system that is modular in its major logical components and flexible in the variety and number of peripheral units which can be attached.

Transistorized Analysis System 218

Victor Adding Machine Co. Data on the improved Victor Class 100, a high-speed transistorized analysis system whose automatic programming allows analysis of data in any chosen sequence.

All-transistorized Computer 219

Philco Corp. Flyer about the Philco 2000 Electronic Data Processing System, the world's first all-transistorized computer system.

Inventory Control 220

Bendix Computer Division. Illustrated application report on how the G-15 Computer helped solve a complex marketing problem.

Filing & Storage

Record Storage 222

Bankers Box Co. "Manual of Records Storage Practice" gives information about the record storage practices of a large number of commercial and industrial firms.

Record-Stack 223

Remington Rand. Folder tells you how you can design your own files for holding microfilmed cards.

Binders 221

C. E. Sheppard. Catalog shows a complete line of binders.

Film & Darkroom Equipment

Processor 225

Filmline Corp. About processor which develops reversal film at 125 fpm and negative film at 55 fpm.

Mono-Copy Paper 226

Anken Film Co. Data on how positive copies can be made directly from negative microfilm with Projection Mono-Copy paper.

Microfilm Processor 227

Canadian Applied Research. Price list on various film processors which accept microfilm.

Camera-Enlarger 228

Dea-Graph Equipment Ltd. Data on the CA 7, a 35mm camera-enlarger for all microfilming and reproduction jobs.

Printer-Processor 229

Kalvar Corp. Interesting information about the Kalfax Microfilm Printer-Processor.

Dry Developer 230

Tecnifax. Information about the Diazo-Micro Dry Developer.

Microfilm Enlarger 231

Durst. Illustrations of the Durst M35, a precision enlarger for microfilm work.

Processing Machine 232

EDL Co. Specifications on a new microfilm processor.

Xerox Copyflo 233

Micro Photo, Inc. Description of the Copyflo printer which produces copies of 16mm or 35mm microfilm on a continuous roll of paper.

Fuji Microfilm 234

Ideax Corp. Brochure gives specifications on Fuji negative and positive microfilm.

Aiglonne America 235

Andre Debrie. Specifications on the Model America processor which replenishes automatically for constant density.

Microfilm 236

Bell & Howell. Data on B&H Neg-

ative Type 1B microfilm including film speed, color sensitivity, filter factors and resolving power.

Mini-Rapid Processors **237**

Fairchild Camera & Instrument Co. Booklet describes Fairchild's line of processors with leaderless film delivery.

Film Processor **239**

Houston Fearless. Close-up photos of working parts add interest to this brochure which describes the HF 16mm or comb. 16/35mm microfilm processors.

Anhydrous Hypo Material **240**

Philip A. Hunt. Learn why this chemical is superior to rice crystals for use in film processing.

Engineering Repro Film **247**

DuPont. Data on the Cronaflex line of reproduction materials. These films provide positive, black-line copies.

Reproduction

Mimeograph **244**

A. B. Dick Co. Folder on the new Model 455 mimeograph, a machine that delivers up to 10,000 copies on one filling of ink.

Automatic Xerography **245**

Haloid Xerox. Learn how you can reduce space taken up by engineering drawings by 95 per cent with the Haloid Xerox utilized system.

Copyflo **246**

General Microfilm Co. Information on the only commercial Haloid Xerox Copyflo installation in New England.

Auto-Stat **249**

American Photocopy Equipment Co. Information and illustrations on new one-step copymaker with automatic control.

Photostat Photocopiers **250**

Photostat Corp. Specifications on Photostat #2 Standard, #2 Special and #4 Standard Photostat copiers.

Photocopy Equipment **251**

Cormac Photocopy Corp. Handy catalog shows complete line of photocopy equipment and accessories.

Services

MCA Tour **242**

Microfilming Corp. of America. A candid tour of MCA's laboratory shows how you can save time, space and money in records program.

Microfilm Facilities **202**

Microdealers. Folder describes nationwide services of this company which include microfilming of engineers drawings, public records, etc.

Microfilm Accessories **262**

Atlantic Microfilm Corp. Sales catalog describes the various products manufactured by Atlantic.

Reproduction Paper **263**

Andrews Paper and Chemical Co. Data on a silver-sensitized paper suitable for fine line reproduction.

Management Bulletins

Order Picking Equipment **253**

North American Equip. Corp. Data on efficiency features of cost cutting order picking equipment.

Flow Chart Planning Kit **254**

Tab Products Co. New Flow Chart Planning Kit which speeds up, simplifies, and improves flow charting.

Procedure-Writer's Forms **255**

The Pro-Forms Co. Data on Pro-Forms, the procedure-writer's forms.

Management Bookshelf **258**

American Management Association. Sample copy of "Management Bookshelf" which describes the new and current publications of the American Management Association.

Systemation **259**

Ross-Martin Co. Information about "Systemation," a semi-monthly newsletter on system trends and techniques.

Dictater-Transcriber **260**

DeJur Grundig. Information about the Stenorette-T, a versatile dictating-transcribing machine.

Microfilm Cards

Unitization **201**

Microcard Corp. Literature tells how microcards make reference data instantly available to you.

Filmsort Products **261**

Filmsort Co. 16-page brochure written in an informative and readable style describes line of Filmsort cards and machinery.

Actifilm Cards **264**

Datagraphic Systems. Description of the Actifilm card file system which allows a drawing 35 feet long to be reduced to tabulating card size.

NEW PRODUCTS

continued from page 8

Data Machines **111**

Two IBM Tele-processing data machines – electronic devices that talk to each other in computer language via regular toll telephone calls – have been announced by *International Business Machines Corp.* The IBM 7701 Magnetic Tape Transmission Terminal sends business and scientific data at the rate of 150 characters or 30 words a second. The Data Transceiver equipped with a dial-up telephone feature can transmit ten 80-column punched words a second. Typical of organizations with many field offices for which the IBM 7701 is designed are government agencies and companies in the insurance, petroleum and chemical industries.

Light Control **112**

A device assuring even densities on microfilm negatives of engineering drawings is being sold by *Microdealers, Inc.* This device can be attached to any existing camera and by means of an electronic eye scans the copy to be filmed as well as automatically adjusting the light voltage to obtain even density regardless of background density of the original material. Costly errors in exposure, often occuring with the previous manual method of changing voltage on light and requiring reshoots, can be eliminated even with unskilled operators. Price of the unit is $750.

Computer **113**

The NCR 390, part of a data processing system, is the first computer able to read and process a document. A *National Cash Register Co.* product,

the 390 accepts magnetically-coated ledger cards. In one use cash registers were linked to punched tape recorders to produce tapes of daily transactions.

continued on next page

Tapes were then mailed to the home office where they were processed by the 390. The 390 rents for $1850 a month.

Spray Processor 114

High Speed Equipment Inc. has introduced its Model FA-50 Spray Processing Machine which is said to combine the outstanding features of spray processing with heavy-duty construction for continuous operation. With two gallons of developer and hypo the FA-50 will process 16/35mm perforated and unperforated stock at speeds up to 50 ft. per minute. Both sprocket- and friction-type drives are available.

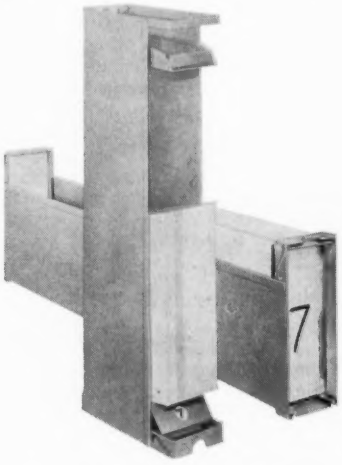
Construction of cabinets, frames and covers is of stainless steel while plumbing is of PVC and tygon for ease of maintenance and durability.

Magnetic Degausser 115

A degausser which automatically erases signals from magnetic tape while still on reels has been introduced by *Consolidated Electrodynamics Corp.* Designated the 5-055A, the degausser erases tape recorded to saturation so that it is at least 50 decibels below normal record level. The degausser can be used with NARTB reel hubs from 7 to 14 in. in diameter, and with tapes up to 2 in. wide. Adapters are available for use with reels of other dimensions. Weight of the 5-055A is 80 pounds.

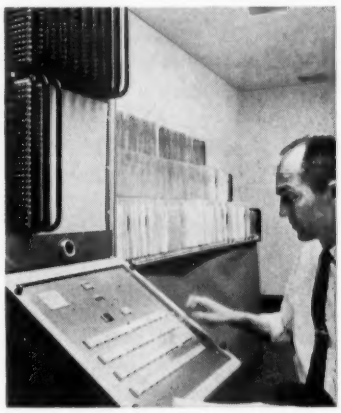
Tab Card Tray 116

A vertical processing card tray designed for speeding up punched card handling is available from *Diebold, Inc.* The tray serves as a storage unit, pocket for the sorter rack, card carrier and machine feeder. Among its features is a built-in "Automatic Angle" that provides for easy card handling when the tray stands on either end. Cards are held in proper position for machine feeding and are angled above horizontal plane to prevent spillage from machine vibration. The tray is made of electrostatically enameled steel.



Correlator 117

Robodyne is marketing the Dynasort Correlator which speeds up and simplifies information analysis on the basis of its content and determines automatically its proper distribution or classification. The correlator is used at *Time* magazine where it channels incoming news messages to appropriate editors in accordance with the contents of a given cabled message. Part of the system includes a memory bank which is easily accessible so that program changes can be made quickly and easily. □



One in a series of displays for the operations executive

CONSIDER THE IMPORTANCE OF

ELECTRONIC DATA PROCESSING

SYSTEMS ANALYSIS

IN YOUR ORGANIZATION

The *proper* systems analysis of your operation now will expose paths of greatest economy and efficiency to follow *when* your firm decides to utilize EDP, but only if expertly performed. This analysis should *not* change your present procedures to suit a particular machine but should allocate available equipment to satisfy your requirements. Thus only a broad impartial knowledge of all devices on the part of the analyst, coupled with his decades of actual in-plant management experience, can transform technical computer terminology into meaningful industrial profits through the new speeds, accuracy and efficiency inherent in the adaptation of EDP as a management tool.

If production and inventory control, sales analyses and reports, market and new product research, quality control or plant accounting are your responsibility, we would be happy to hear of your particular requirement, without obligation of course. Let us describe how a system built around your MO, and employing proper components, can effect substantial accelerations in your operation.

If you would care to receive Data News Patterns, an informative, periodic electronic bulletin, free, write Dept. DNP.

DATA Patterns INCORPORATED

OBJECTIVE ENGINEERING SPECIALISTS IN

INDUSTRIAL, FINANCIAL & SCIENTIFIC EDP SYSTEMS ANALYSIS AND APPLICATION

22 EAST 17 STREET, NEW YORK 3, N. Y.

Circle No. 505 on Post Card

MERCHANDISING

continued from page 23

A procedure has been established to rate individual store efficiency in sales recording. It involves comparing the reliability of paper tape punching at each store. The percentage of error is calculated by dividing total punched paper tape errors, before corrections, by the total number of items punched. When the daily cash report register total and corresponding punched paper tape register total differ by more than one quarter of one per cent (within a week's period), the store manager is asked to investigate and take corrective action. This method guarantees that the sales analysis system is working and that the retail operator can practice modern merchandising with EDP. □

AIR FORCE

continued from page 19

ords retirement program. It is estimated that one engineering drawing out of every eight in Air Force files should be discarded. However, the manpower and the data to perform this necessary house cleaning have been lacking in the past.

Another space factor involves the transporting of data. One cargo plane can carry 70 times as many aperture cards as full-size reproducibles. The payload of aperture cards weighs but one-fourth that of prints.

Some other benefits:

- By projecting the microfilm on screens for conference viewing, data can be furnished simultaneously to groups instead of having drawings reviewed by one person at a time.
- Punch card data provides control over security classification, proprietary rights for drawings, interchangeability, model application, parts application, data lists and the like.
- It is typical of both military operations and reproduction room procedures that there are peaks and valleys in output. With the miniaturized reproducible in an aperture card, there is a degree of mechanization not possible with the conventional operations. This mechanization helps meet sudden demand with a minimum increase in personnel.
- The contractor should be able to exercise a higher level of quality control over the data he supplies the Air Force than was possible heretofore. Making 50,000 film frames and the necessary punch cards does not compare in magnitude with the job of reproducing 7,500,000 square feet of prints and 250,000 square feet of reproducibles.
- The time required for filming and card punching is another factor in favor of the contractor. It should be easier and faster to get drawings filmed and back in the file with the new techniques than with the conventional ones. □

Rapid Enlargement AND Instantaneous Processing of Microfilms BY THE Rollacopy Process

A

Andrews Paper & Chemical Co., Inc.
P.O. BOX 528
676 Northern Boulevard,
Great Neck, N. Y.
Telephone: HUnter 2-6930

Circle No. 503 on Post Card

NOW READ THIS!

FUJI CAN IMPROVE YOUR MICRO FILMING OPERATION !

Since its introduction into the United States, Fuji Microfilm has established itself as a reliable, standardized product. Ask us to show you how Fuji can improve your microfilming operation. You can convince yourself with samples and price lists which are available on request.

FUJI MICROFILM negative and positive

A product of Fuji Photo Film Company, Ltd. — one of the world's largest producers of photosensitive materials. Manufactured with the strict adherence to the most rigid standards of quality control.

FINE PRODUCTS

Exclusive U. S. Representative

ideax CORPORATION

150 Fifth Avenue, New York 11, N. Y. • OR 5-4860

Circle No. 508 on Post Card

MOS $$$$

continued from page 17

each — also reduce sharply.

— Standardized production levels will mean that inventory, rather than employment, will fluctuate resulting in savings in inventory dollars and money spent on unemployment insurance.

American Bosch's procedures are based on an advanced method of level-by-level net requirements planning on the random access computer. Coupled with this is automatic low-level coding. This determines the lowest common denominator unit in which a part appears and accounts for the total requirements of that part.

Wide Variety of Products

American Bosch's products, for example, include diesel fuel injection equipment, automotive electrical equipment, LPG carburation equipment and small-horsepower motors.

In the plant and within the computer, the ingredients that go into these end products are divided into successive levels, Christmas-tree fashion. At the base are raw materials. Above these are the component parts fabricated from raw materials and purchased parts. At the next levels are minor assemblies, sub-assemblies built from the components and major assemblies, constructed from the sub-assemblies. At the top of the tree are the finished products made up of various major assemblies.

Any given end product may make use of an assembly which also is used in many other end products and the raw materials needed for a particular component may be found in all American Bosch products. Thus, an order requiring one type of component could affect the supply of material needed for hundreds of other products.

The computer protects American Bosch against the development of material shortages and production delays by the simple expedient of checking, at electronic speeds, down through each material level. It does so for each production schedule.

Here is how it works on a given order for a thousand units of a pump to go into production on a given M-Day. When the order is received, an IBM card is punched and put into the computer. It searches out the first inventory level, major assemblies, and computes the quantity of each assembly needed for 1,000 pumps.

The computer indicates how many assemblies are available, how long American Bosch will need to make them if they are not available and on what M-Day they should be scheduled for production. At this point, the computer also decides if it would be more economical to put 2,000 or 5,000 assemblies — rather than only 1,000 — into production.

The computer continues to check down through the level-by-level structure of American Bosch's bills of material to determine what must be done at each level to satisfy the order and to assure proper material controls. In the event that enough material is not on hand or on order, the company receives an immediate warning to expedite the purchase of that material. □

PHOTOMEMORY

continued from page 13

is being increasingly used as a tool for streamlining existing systems. Microfilm of this kind which has already converted hard copies to film can speed the conversion to photomemory units at a later date and on a direct input basis.

In the process of getting ready, microfilm can be used to save time, people and dollars, and at the same time, achieve the important by-products of saving space and safeguarding records. There are many good and proved microfilm applications from a procedural viewpoint. For example, the cycle billing operation use of credit card accounting or handling accounts receivable. Sales slips and statements can all be returned to the customer with only a film record retained. At a later date, the film record can serve as direct input to the photomemory unit if necessary.

What is the true state of the art? How far away are we from the photomemory systems? Various components of photomemory units are now becoming available. The fact that working photomemory units (commercially available) have not arrived as yet is probably not a reflection on the state of the art but rather a reflection on our capability of designing systems around which engineers can design workable equipment.

Today we already have combinations of microfilm records and punched cards that allow the use of punched card selection and withdrawal techniques for extracting desired images. This has been pioneered by the U. S. government. Potential applications are so broad, however, that many industries are working on their own systems. One automatic retrieval method already developed depends on magnetic cards as the basic medium for information storage. This offers obvious possibilities for combination with microfilm records. Magnetic spots are used as the coding medium to take advantage of the high speed access and retrieval techniques in the system.

From this it is only one step to a true photomemory system based on electronic selection methods and retrievable photo images.

The arrival of photomemory units will give a whole new dimension to management planning, systems and action. It will extend tremendously management's evaluating ability by providing a completely automated and integrated information processing system that gives the decision maker what he needs when he needs it. □

INFORMATION MANAGEMENT

continued from page 7

information should be extracted from *operational* data in the routine flow built into the data processing system. (In his article, "The Staffman in the Decision-Making Process," published in the May 1960 issue of ADVANCED MANAGEMENT, Truman Benedict defines *data* as "any facts that are a matter of direct observation," and *information* as "data that are new, accurate and timely, and, for business use, understandable and relevant to a matter under consideration and about which a manager can decide.")

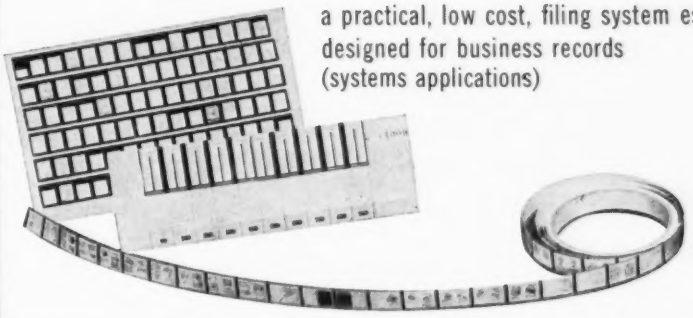
Still to be Realized

The real potential of data processing is still to be realized. The *big* achievement will be a reporting structure, integrated into the total management complex, into which operational data will be fed at the source (local or branch offices, field locations, production centers, component units of a retail chain, etc.) to be processed, collated and consolidated, correlated, digested, analyzed and refined through efficient and economical automation to serve the needs of all levels of management. When that has been accomplished, and the paperwork and writing and rewriting, and processing and reprocessing have been reduced to an essential minimum, the electronic computers, microfilmers, devices and related equipment will have earned their keep and DATA HARNESSING will have become the byword of managerial proficiency.* □

* After this paper had been prepared, IBM released a description of its new Management Operating System designed to perform six basic manufacturing functions: sales forecasting, materials planning, inventory management, plant scheduling, work dispatching, and operations evaluation. The chain of events is set in motion each time a customer order in punch card form is fed into the system. Except for *management decision* changes this single system controls the production cycle. For details on how it works at American Bosch Arma Corporation see page 16.

Microtape...

a practical, low cost, filing system especially designed for business records (systems applications)



MICROTAPE* filing systems are a new concept in records keeping, for they offer the full protection and space-saving advantages of microfilm on active records, plus increased efficiency, plus the flexibility of MICROCARDS.* It is ideal for systems applications or for single copy or minimum copy users.

THE CARDS

A typical MICROTAPE card is 3″ x 5″, on which you can attach 40 pages of 8½″ x 11″ material in MICROTAPE form. You merely cut the rolls of MICROTAPE into proper units and apply to ordinary paper index cards. There's no need for glue or paste, MICROTAPE has a pressure-sensitive adhesive laminated to the back side.

THE METHOD

We make 100′ rolls of 16MM or 35MM positive microtext from your material directly, or from your 16MM or 35MM Microfilm negative rolls. The advantage, of course, in using MICROTAPE cards is that additions and corrections are easily made and they eliminate the need for hunting through thousands of items to find specific material.

MICROCARD READERS

MICROTAPE cards are easily read with any MICROCARD reader. The inexpensive POCKET SIZE model is as small as a package of cigarettes, adjusts to individual eyesight, and operates on battery or 110 Volt current. The desk-size model 6B is equipped with a card moving mechanism, is portable, and occupies only 10½″ x 12″ of table or desk space.

for further information write to:

MICROTAPE SYSTEMS

44 Laura Street • New Haven, Conn. • Tel. HObart 9-1321

National manufacture and distribution under exclusive license from the MICROCARD CORPORATION

*MICROTAPE and MICROCARD are registered trademarks

Circle No. 521 on Post Card

AMAZING

Taskmaster 10xPower

Microfilm Reader

Versatility: Reads 16 mm & 35 mm roll film, aperature cards, & sheet film.

Optical fidelity: Maximum field of view with minimum peripheral distortion.

Compactness: Folds flat into its own shirt-pocket size wallet.

Scanning: 100% vertical & horizontal scanning. Fixed position pin-point reading.

Taylor Merchant

Price $2.50 each. Satisfaction guaranteed.

Dealer inquiries invited.

dept. X

the taylor-merchant corporation

48 west 48th street, new york 36, n.y.

PLaza 7-7700

Circle No. 517 on Post Card

INTERNATIONAL SYSTEMS MEETING of the **SYSTEMS AND PROCEDURES ASSOCIATION**

HOTEL COMMODORE, THE BILTMORE, NEW YORK CITY

OCTOBER 10-13, 1960

Circle No. 516 on Post Card

DEFENSE DEPARTMENT

continued from page 27

MIL-P-9879 specifies the type of 105mm film to be used in photographing construction and architectural drawings, the reduction ratios, the resolution scales, the resolution target to be used and the means of examining the image to determine the inherent resolution. It also specifies that the negatives shall be retouched to improve the image for deletion of areas of the negative as required by the procuring activity.

Document L-F-00334 covers silver halide emulsions and specifies two types of film, Type 1 negative with a jet black dieback and Type 2 positive with antihalation backing. The document spells out the requirements for minimum speed ratings, resolution of no less than 200 lines per millimeter, the width, length and thickness of the film wih acceptable ASA tolerances, base density and all test procedures for product checkout.

Document L-F-00315 specifies the type of diazo film to be used for duplicating purposes and selects two types, Type 1 black and Type 2 sepia. It also specifies three contrast ranges—low, medium and high. Also included are the width of the film, the length, thickness and resolution, sensitometric characteristics and inspection procedures.

Duplicating Film

Document L-F-00330 specifies duplicating film of the heat developing type and selects three classes according to base thicknesses. These are two mil, three mil and five mil and the document also specifies that the base be of the dimensionally stable type. It also specifies width, length and resolution, and tests to be used to determine dimensional stability.

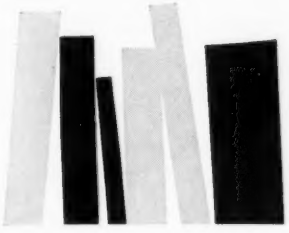
Another document (MIL-STD-804) has been completed that deals with "Formats and Coding of Tabulating and Aperture Cards for Engineering Data Microreproduction Systems." It has not yet been approved for final clearance.

Projects presently in preparation include MISC-0055, "Requirements for Guidance to Draftsmen and Reproduction Personnel Relating to Factors Necessary to Obtain Satisfactory Microreproductions of Engineering Data;" EDMS-0001, "Performance Characteristics of Equipment for EDMS and Standardization Required;" EDMS-0003, "Use of Microfilmed Engineering Documentation Records in lieu of Original Documents Prepared by Design Activities."

MICROFILM TOPICS

continued from page 10

chines some twenty-five years ago. They are still asking for the same features today, without achieving many of them. One of the earliest grants of the Council on Library Resources was to Rutgers University for their study on "Targets for Research in Library Work." The first publication to appear out of this project is: Stewart, Jean et. al. *Reading Devices for Micro-Images.* This two-hundred page book goes into three phases of the problem. There is a historical survey of almost three-hundred references to literature about reading machines. This is followed by a topical summary of some forty-two different features of reading machine operation, and lists models which have been described as embodying these features. These two sections have done the bulk of the routine labor that would be necessary for further study on reading machines. Such study is suggested in the introduction to the book, a summary and evaluation of the state of the art, which presents fourteen topics requiring clarification and further research. This volume is recommended reading for all companies engaged in making reading machines, or those anticipating such activity. □



Systems Bookshelf

Engineering Data Processing System Design

by Arthur D. Even, D. Van Nostrand Co., Princeton, N.J., 282 pp., $6.50.

The microphotographer knows almost as little about the problems of the engineer as does the draftsman about the techniques of the photographer. With interest in microfilming of engineering data increasing, these two groups must learn more about each other's activities. This book by a management consultant who is a member of both the American Institute of Industrial Engineers and the National Microfilm Association will serve as a guide to draftsmen and photographers.

Though designed primarily for engineers, it has information of value to photographers who want to learn what goes on before the engineering drawings are filmed and what happens to the film after it is made and mounted in aperture cards.

The book begins with a description of the engineering department and explains the various techniques used, with reasons for many of them. Subsequent chapters are devoted to designing, installing, operating, controlling, and expanding the data processing system. Samples of record forms are included, as well as organization charts and illustrations of equipment. The illustrations, however, are not as useful as they might be because they are not adequately identified.

The last chapter is a look at future possibilities, when even greater automation may be expected. In order that engineers and photographers may understand each other's jargon, there is a valuable 20-page glossary at the end of the book. This volume is certainly an answer to a definite need. *Hubbard W. Ballou*

Automatic Data-Processing Systems

by Robert H. Gregory and Richard L. Van Horn, Wadsworth Publishing Co., San Francisco, 705 pp.

No high-flown concept book, this volume is crammed with charts, down-to-earth case histories, definitions and arithmetric problems to acquaint laymen with electronic computing systems. The authors know their subject—Dr. Gregory prepared a book on business data processing for the Army Ordnance Corps and Van Horn is research engineer in the logistics department of the Rand Corporation.

Both have put together an ambitious book which could constitute a course of study in data processing. The book presupposes that the reader has a knowledge of logarithms.

The introduction discusses such terms as data collection and conversion, processing and electronic digital computers. From there the book takes off into sections devoted to automatic equipment, programming and processing procedures, principles of processing systems, systems design, and equipment acquisition and utilization.

Of special interest to the beginner is a detailed history of computation and data processing devices plus a 15-page glossary.

Suspect Documents

by Wilson R. Harrison, Frederick A. Praeger Publishers, N.Y.C., 583 pp., $15.

In his chapter, "Photography of Documents," the author states: "Photography has to be applied to so many aspects of the work of the document examiner that the modern document laboratory may be said to be built around its studios and darkrooms." This chapter is the longest of fifteen well-filled chapters, and its 69 pages might well serve as a textbook for anyone faced with a document photography problem.

ADVERTISERS INDEX

Alves Photo Service, Inc.	31
Ana-Tec, Inc.	6
Andrews Paper & Chemical Co.	35
Anken Chemical Corp.	2
Canadian Applied Research, Ltd.	4
Data Processing Engineering Co.	Cover II
Dejur Amsco Corp.	Cover II
Gevaert Company of Amer. Inc.	1
Haloid Xerox Inc.	Cover IV
Ideax Corp.	35
Keuffel & Esser Co.	25
Microdealers, Inc.	7
Microtape Systems, Inc.	39
Minnesota Mining & Mfg. Co.	20, 21
Photo Devices, Inc.	31
Prestoseal Manufacturing Corp.	10
Recordak Corp.	Cover IV
Remington Rand	11
Systems & Procedures	38
Taylor-Merchant Corp.	38

A VITAL SERVICE

for the Microphotographic Industry

The National Microfilm Association was organized as a non-profit corporation. Its purposes are to advance the interests of the microreproduction industry. Membership in the Association is open to all corporate groups and interested individuals. For complete information *and* FREE copy of the N.M.A. Handbook. . . .

tear off and mail to: **EXECUTIVE SECRETARY**

NATIONAL MICROFILM ASSOCIATION
P.O. Box 386
Annapolis, Md.

Company Name .....
Your Name & Title .....
Address .....
City & State .....

NEWSMAKERS

Frederic Luther

Frederic Luther is the new president of the National Microfilm Association. He was elected at a recent meeting of the association in New York.

Head of a service company which bears his name, he served as chairman of the membership committee last year. During his tenure, membership of the association more than doubled.

Mr. Luther is a microfilm historian as well as a practitioner. His *Microfilm: A History, 1839-1900* has become a basic textbook in the field.

Edward Rosse

Edward Rosse administers one of the largest photographic record systems in the world, that of the Social Security Administration. Between 60,000 and 100,000 references to microfilm are made each day at the Administration's Baltimore office. Mr. Rosse recently was the featured speaker at an Eastman Kodak Office Copying Systems luncheon.

Michael Tikson

Michael Tikson has joined the staff of the Battelle Memorial Institute, Columbus, Ohio, where he will be in charge of the digital computing center. The author of several papers on mathematics for digital computers, Tikson has been a member of the policy committee of the Univac Scientific Exchange.

Admiral Holden

The appointment of Richard Holden, Rear Admiral, US Navy, Retired, as director of the advanced systems development department has been announced by the Philco Corporation's Government and Industrial Group. In this capacity, Admiral Holden will coordinate Philco's activities in this area with extensive emphasis in anti-submarine warfare.

Award Winners

Eldon C. Hall, Massachusetts Institute of Technology, and Samual A. Francis, Francis Associates, received Certificates of Excellence as a result of the 1959 Miniaturization Awards competition. Hall and Francis won their certificates for a digital computer packaging developed by them using the "MiniWeld" process. This process allows the computer to be constructed in one encapsulated assembly for a total volume of less than one-eighth of a cubic foot. The unit is about one-fourth the size and one-half the weight of previous designs using the printed circuit package. The computer logic is obtained entirely through use of a single standardized circuit which performs all required logic functions through its inter-connection scheme. The unit also contains memory sections, associated clock circuitry and input-output circuitry.

Harold P. Field

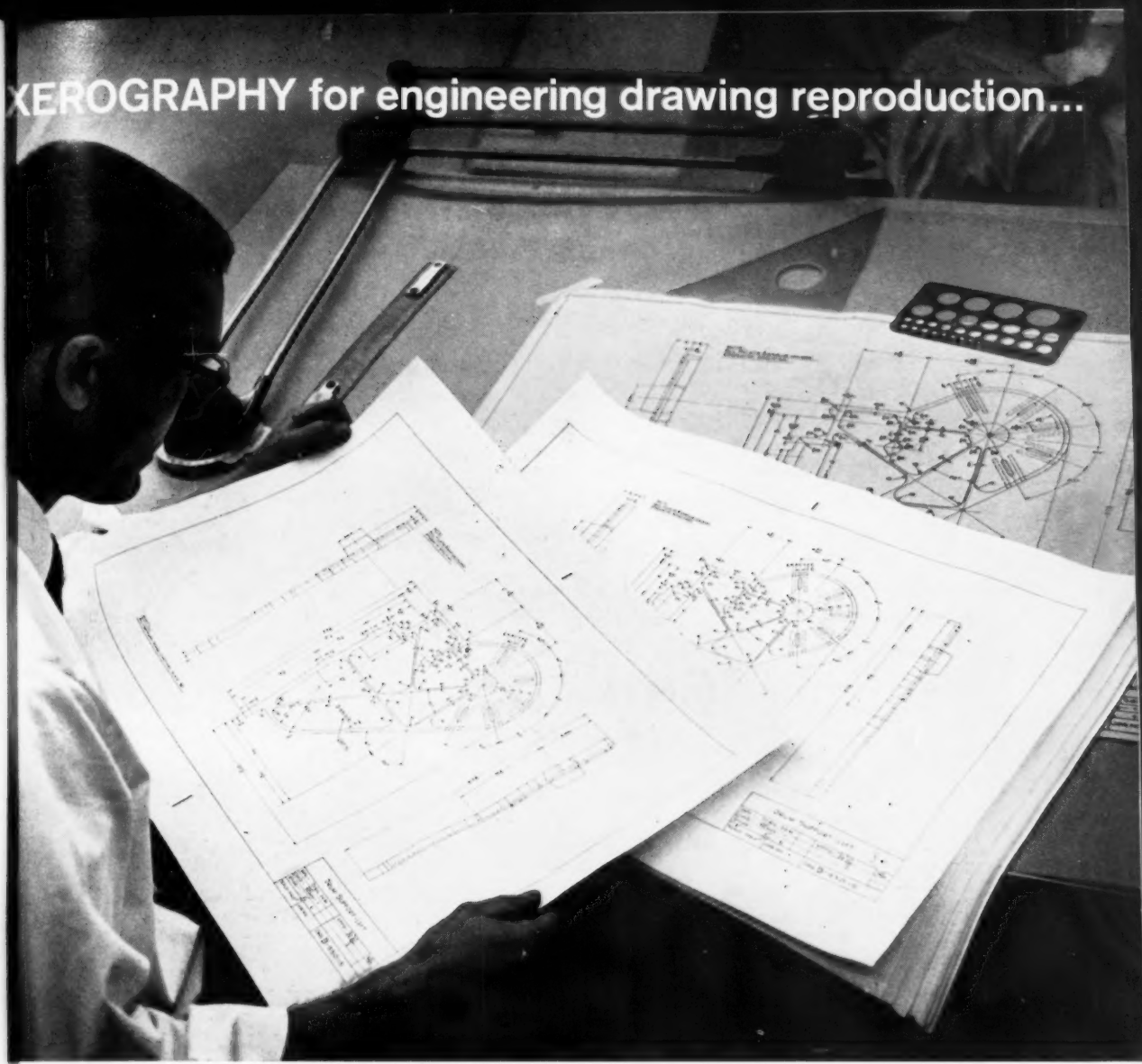
Harold P. Field was appointed Director of Plans and Programs for the System Development Corporation. Nominated "One of the Ten Outstanding Young Men of 1958" by the U.S. Chamber of Commerce, Mr. Field came to SDC following 13 years with Stromberg Carlson.

John S. Sayer

Nationally known management engineer John S. Sayer has joined Documentation, Inc., Washington, D.C., as general manager of the data storage and retrieval firm. He will supervise systems studies, systems engineering and data processing operations. He comes to Documentation from E.I. du Pont.

Other Names: Joel M. Kibbee has been named manager of customer educational services of the Remington Rand Univac Division.

Conrad Young was appointed marketing manager of the communications and weapons division for the Philco Corporation's Government and Industrial Group. □

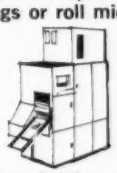


. . . gives you high-quality engineering prints in half the time, at remarkable savings!

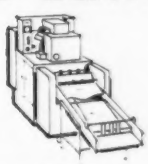
Xerography is the fast, clean, dry, electrostatic copying process that has revolutionized engineering drawing reproduction! Many of the nation's leading industrial firms now use Haloid Xerox copying equipment . . . with reported savings from $20,000 to $500,000 a year! And, all XeroX equipment is available to you, without capital investment, at modest monthly rentals.

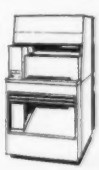
For high quality offset paper masters: XeroX® Model 1218 copying equipment combines with offset duplicating . . . and the results are spectacular! This equipment prepares sharp, inexpensive paper masters from original drawings of A to D size. The larger drawings are perfectly reduced to 12" x 18" masters, from which multiple prints can be run off in seconds!

Volume reproduction from original drawings or roll microfilm: Just push a button on the XeroX Copyflo® Continuous Printer for sharp, dry, ready-to-use prints (on ordinary paper, vellum or offset paper masters up to 11" wide). Prints are made at the rate of 20′ a minute. Copyflo printers enlarge, reduce or copy size-to-size from original drawings or roll microfilm (16 or 35mm).



Reproduction from card-mounted microfilm: The XeroX Copyflo 24 C and the exciting new Copyflo 1824 automatically produce dry, positive prints on ordinary paper, vellum or offset paper masters from 35mm card-mounted microfilm! The Model 24 produces ready-to-use prints (up to 24" x 36") at the rate of 20 linear feet a minute! The new Model 1824 for small volume users or large, decentralized users, produces prints from 8½" x 11" to 18" x 24".

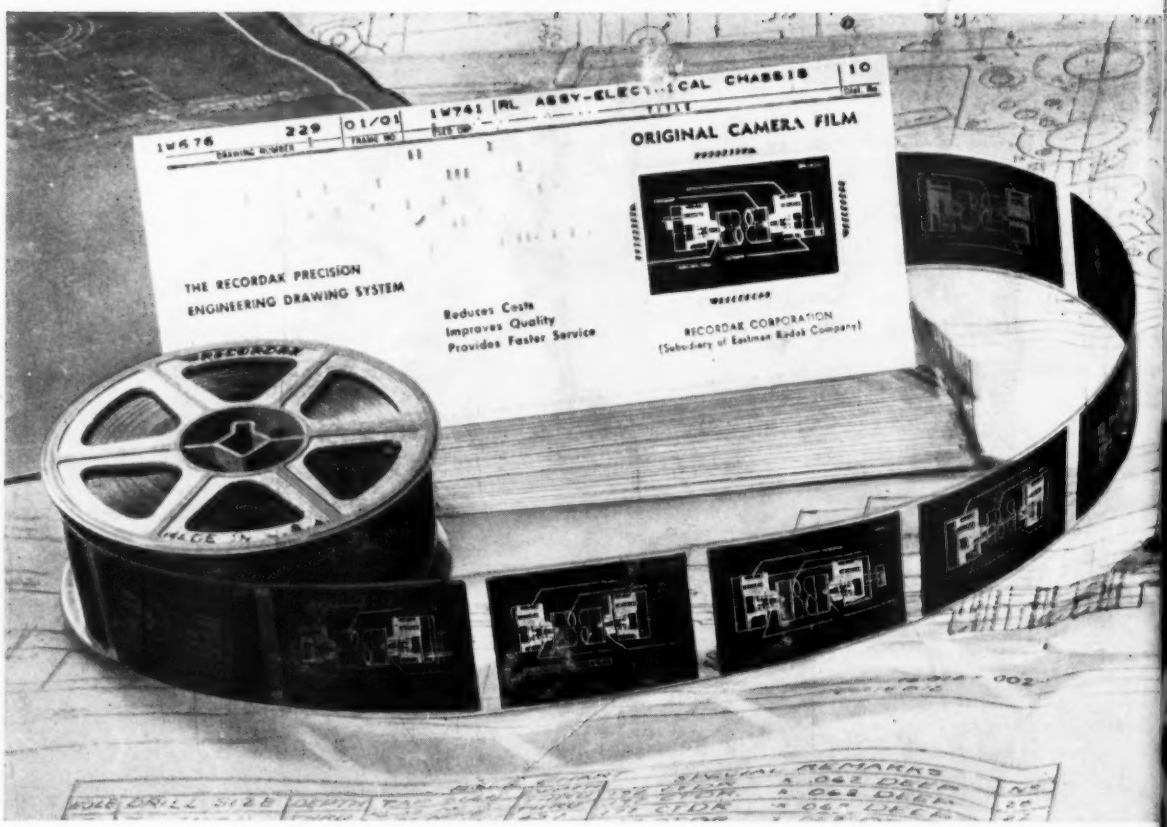




GET ALL THE FACTS! Send for Booklet EDX today. Write: HALOID XEROX INC., 60-133X Haloid St., Rochester 3, N. Y. Branch offices in principal U. S. and Canadian cities. Overseas: Rank-Xerox Ltd., London.

HALOID XEROX®

Circle No. 507 on Post Card



Take the "wait" out of reference and printmaking with Recordak microfilming!

Needle-sharp Recordak microfilm images mounted on Filmsort aperture cards are speeding routines in engineering departments large and small.

Complete active drawing files are at the fingertips in just 5% of the space needed for originals. Any drawing—out of thousands—found quickly and viewed clearly in a RECORDAK Film Reader.

This, naturally, reduces the need for reference blueprints, adds up to notable savings in time and printmaking costs. You can also count on savings when you need prints. For with this new system, reduced-scale paper prints can be made directly from your aperture cards by low-cost photographic, xerographic or electrostatic methods. Also, duplicate film cards for branches, vendors, or government agencies can be made for pennies apiece.

Key to successful operation

Outstanding picture quality of Recordak microfilm images (120 lines per mm resolution at 30 to 1 reduction) more than meets DOD requirements.

Free booklet gives facts on this RECORDAK Precision Engineering Drawing System available through Recordak and its nation-wide dealer organization. No obligation whatsoever.

RECORDAK®

(Subsidiary of Eastman Kodak Company)

originator of modern microfilming —*now in its 33rd year*

IN CANADA contact Recordak of Canada Ltd., Toronto

Circle No. 514 on Post Card